# Jaehyung Seo

KOREA UNIVERSITY · NLP & AI LA

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### **Research Interests**

I am currently a Ph.D candidate in the Department of Computer Science and Engineering at Korea University (Advisor: Heuiseok Lim). I am a co-founder and CTO of KU-NMT Group. I have published more than 50 papers in the field of Natural Language Processing, Computer Science, and applied for 4 patents.

- Natural Language Processing
- Artificial Intelligence
- Commonsense Reasoning
- Natural Language Generation
- Language Resource and Evaluation
- Language Modeling
- Decoding Strategy
- Neural Machine Translation
- Speech Recognition Post-Processor
- Data Management and Engineering
- Semantic Search and Information Retrieval

### **Education**

#### Korea University

Ph.D candidate in Computer Science and Engineering, (GPA: 4.47 / 4.5)

- Advisor: Heuiseok Lim
- Natural Language Processing & Artificial Intelligence Lab
- Co-Founder and CTO of KU-NMT Group.

#### **Korea University**

B.A. IN ENGLISH LANGUAGE AND LITERATURE & BUSINESS SCHOOL, (GPA: 4.19 / 4.5)

Advisor: Donguk Kim

## Academic Services

#### Reviewer

LANGUAGE RESOURCE AND EVALUATION & MULTILINGUAL

#### • EMNLP 2023

#### Reviewer

LANGUAGE RESOURCE AND EVALUATION & LANGUAGE MODELING

• ACL 2023

#### Reviewer

COMPUTATIONAL SOCIAL SCIENCE AND CULTURAL ANALYTICS

• NAACL 2024

#### Reviewer

GENERATION & LANGUAGE RESOURCE AND EVALUATION
• ACL 2024

#### Reviewer

GENERATION & LANGUAGE RESOURCE AND EVALUATION

• EMNLP 2024

## **Selected** Publications

Seoul, South Korea Sep. 2020 - Aug. 2025

Seoul, South Korea Mar. 2014 - Exp. Aug. 2020

> South Korea October.2023

South Korea January.2023

South Korea December.2023

South Korea February.2024

South Korea June.2024

- KNOTICED: Augmentative and Alternative Communication Software for Language Developmental Disabilities Sugyeong Eo, Jungwoo Lim, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim LREC-COLING 2024 - The Joint International Conference on Computational Linguistics, Language Resources and Evaluation
- KoCommonGEN v2: A Benchmark for Navigating Korean Commonsense Reasoning Challenges in Large Language Models Jaehyung Seo, Jaewook Lee, Chanjun Park, SeongTae Hong, Seungjun Lee, Heuiseok Lim ACL 2024 - Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics
- Length-aware Byte Pair Encoding for Mitigating Over-segmentation in Korean Machine Translation Jungseob Lee, Hyeonseok Moon, Seungjun Lee Chanjun Park, Sugyeong Eo, Hyunwoong Ko, **Jaehyung Seo**, Seungyoon Lee, Heuiseok Lim

ACL 2024 - Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics

Leveraging Pre-existing Resources for Data-Efficient Counter-Narrative Generation in Korean Seungyoon Lee, Chanjun Park, DaHyun Jung, Hyeonseok Moon, Jaehyung Seo, Sugyeong Eo, Heuiseok Lim LREC-COLING 2024 - The Joint International Conference on Computational Linguistics, Language Resources and Evaluation

Generative Interpretation: Toward Human-Like Evaluation for Educational Question-Answer Pair Generation Hyeonseok Moon, Jaewook Lee, Sugyeong Eo, Chanjun Park, Jaehyung Seo, Heuiseok Lim EACL 2024 - Findings of the Association for Computational Linguistics

Hyper-BTS Dataset: Scalability and Enhanced Analysis of Back TranScription (BTS) for ASR Post-Processing Chanjun Park, Jaehyung Seo, Seolhwa Lee, Junyoung Son, Hyeonseok Moon, Sugyeong Eo, Chanhee Lee, Heuiseok Lim EACL 2024 - Findings of the Association for Computational Linguistics

CReTIHC: Designing Causal Reasoning Tasks about Temporal Interventions and Hallucinated Confoundings Changwoo Chun, SongEun Lee, Jaehyung Seo, Heui-Seok Lim EMNLP 2023 - Findings of the Association for Computational Linguistics

CHEF in the Language Kitchen: A Generative Data Augmentation Leveraging Korean Morpheme Ingredients Jaehyung Seo, Hyeonseok Moon, Jaewook Lee, Sugyeong Eo, Chanjun Park, Heuiseok Lim EMNLP 2023 - Proceedings of the Conference on Empirical Methods in Natural Language Processing

Informative Evidence-guided Prompt-based Fine-tuning for English-Korean Critical Error Detection Dahyun Jung, Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heui-Seok Lim IJCNLP-AACL 2023 - Proceedings of the 13th International Joint Conference on Natural Language Processing and the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics

- Knowledge Graph-Augmented Korean Generative Commonsense Reasoning Dahyun Jung, Jaehyung Seo, Jaewook Lee, Chanjun Park, Heuiseok Lim *ICML-DMLR workshop* (2023)
- **KEBAP: Korean Error Explainable Benchmark Dataset for ASR and Post-processing** Seonmin Koo, Chanjun Park, Jinsung Kim, **Jaehyung Seo**, Sugyeong Eo, Hyeonseok Moon, Heui-Seok Lim *EMNLP 2023 - Proceedings of the Conference on Empirical Methods in Natural Language Processing*
- Uncovering the Risks and Drawbacks Associated with the Use of Synthetic Data for Grammatical Error Correction Seonmin Koo, Chanjun Park, Seolhwa Lee, **Jaehyung Seo**, Sugyeong Eo, Hyeonseok Moon, Heuiseok Lim *IEEE Access* (2023). IEEE
- PEEP-Talk: A Situational Dialogue-based Chatbot for English Education

Seungjun Lee, Yoonna Jang, Chanjun Park, Jungseob Lee, **Jaehyung Seo**, Hyeonseok Moon, Sugyeong Eo, Seounghoon Lee, Bernardo Yahya, Heui-Seok Lim

ACL 2023 - Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 3: System Demonstrations)

A Survey on Evaluation Metrics for Machine Translation Seungjun Lee, Jungseob Lee, Hyeonseok Moon, Chanjun Park, Jaehyung Seo, Sugyeong Eo, Seonmin Koo, Heuiseok Lim *Mathematics* 11.4 (2023) p. 1006. MDPI

Doubts on the reliability of parallel corpus filtering Hyeonseok Moon, Chanjun Park, Seonmin Koo, Jungseob Lee, Seungjun Lee, **Jaehyung Seo**, Sugyeong Eo, Yoonna Jang, Hyunjoong Kim, Hyoung-gyu Lee

Expert Systems with Applications 233 (2023) p. 120962. Elsevier

- Synthetic Alone: Exploring the Dark Side of Synthetic Data for Grammatical Error Correction Chanjun Park, Seonmin Koo, Seolhwa Lee, **Jaehyung Seo**, Sugyeong Eo, Hyeonseok Moon, Heuiseok Lim ICML-DMLR workshop (2023)
- QUAK: A Synthetic Quality Estimation Dataset for Korean-English Neural Machine Translation Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Gyeongmin Kim, Jungseob Lee, Heui-Seok Lim

COLING 2022 - Proceedings of the 29th International Conference on Computational Linguistics

- Word-level Quality Estimation for Korean-English Neural Machine Translation Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim *IEEE Access* 10 (2022) pp. 44964–44973. IEEE
- A Dog Is Passing Over The Jet? A Text-Generation Dataset for Korean Commonsense Reasoning and Evaluation Jaehyung Seo, Seounghoon Lee, Chanjun Park, Yoonna Jang, Hyeonseok Moon, Sugyeong Eo, Seonmin Koo, Heuiseok Lim NAACL 2022 - Findings of the Association for Computational Linguistics, Seattle, United States
- Dense-to-Question and Sparse-to-Answer: Hybrid Retriever System for Industrial Frequently Asked Questions Jaehyung Seo, Taemin Lee, Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Imatitikua D Aiyanyo, Kinam Park, Aram So, Sungmin Ahn, Jeongbae Park

#### Plain Template Insertion: Korean-Prompt-Based Engineering for Few-Shot Learners

Jaehyung Seo, Hyeonseok Moon, Chanhee Lee, Sugyeong Eo, Chanjun Park, Jihoon Kim, Changwoo Chun, Heuiseok Lim *IEEE Access* 10 (2022) pp. 107587–107597

PU-GEN: Enhancing generative commonsense reasoning for language models with human-centered knowledge
 Jaehyung Seo, Dongsuk Oh, Sugyeong Eo, Chanjun Park, Kisu Yang, Hyeonseok Moon, Kinam Park, Heuiseok Lim
 Knowledge-Based Systems (2022) p. 109861. Elsevier
 Research on Utilization Strategy of User Engagements in Korean Fake News Detection

 Myunghoon Kang, Jaehyung Seo, Chanjun Park, Heuiseok Lim *IEEE Access* (2022) pp. 1–1
 K-NCT: Korean Neural Grammatical Error Correction Gold-Standard Test Set Using Novel Error Type Classification Criteria Seonmin Koo, Chanjun Park, Jaehyung Seo, Seungjun Lee, Hyeonseok Moon, Jungseob Lee, Heuiseok Lim *IEEE Access* (2022). IEEE
 REEPTOFIC: Solving TOFIC Problems Using Simple and Efficient Data Augmentation Techniques with Protrained Transfer

BERTOEIC: Solving TOEIC Problems Using Simple and Efficient Data Augmentation Techniques with Pretrained Transformer Encoders

Jeongwoo Lee, Hyeonseok Moon, Chanjun Park, Jaehyung Seo, Sugyeong Eo, Heuiseok Lim *Applied Sciences* 12.13 (2022) p. 6686. Multidisciplinary Digital Publishing Institute

Return on Advertising Spend Prediction with Task Decomposition-Based LSTM Model

Hyeonseok Moon, Taemin Lee, **Jaehyung Seo**, Chanjun Park, Sugyeong Eo, Imatitikua D Aiyanyo, Jeongbae Park, Aram So, Kyoungwha Ok, Kinam Park

Mathematics 10.10 (2022) p. 1637. MDPI

A Self-Supervised Automatic Post-Editing Data Generation Tool

Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Jaehyung Seo, SeungJun Lee, Heuiseok Lim *ICML 2022 - DataPerf workshop* (2022)

- An Automatic Post Editing with Efficient and Simple Data Generation Method Hyeonseok Moon, Chanjun Park, Jaehyung Seo, Sugyeong Eo, Heuiseok Lim IEEE Access (2022). IEEE
- **Empirical Analysis of Noising Scheme based Synthetic Data Generation for Automatic Post-editing** Hyeonseok Moon, Chanjun Park, Seolhwa Lee, **Jaehyung Seo**, Jungseob Lee, Sugyeong Eo, Heuiseok Lim *LREC 2022 - Proceedings of the Language Resources and Evaluation Conference*, Marseille, France
- The ASR Post-Processor Performance Challenges of BackTranScription (BTS): Data-Centric and Model-Centric Approaches Chanjun Park, Jaehyung Seo, Seolhwa Lee, Chanhee Lee, Heuiseok Lim *Mathematics* 10.19 (2022)

#### PicTalky: Augmentative and Alternative Communication Software for Language Developmental Disabilities Chanjun Park, Yoonna Jang, Seolhwa Lee, Jaehyung Seo, Kisu Yang, Heuiseok Lim

IJCNLP-AACL 2022 - The 2nd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics

#### Priming Ancient Korean Neural Machine Translation

Chanjun Park, Seolhwa Lee, Jaehyung Seo, Hyeonseok Moon, Sugyeong Eo, Heuiseok Lim LREC 2022 - Proceedings of the Language Resources and Evaluation Conference, Marseille, France

- Empirical Analysis of Parallel Corpora and In-Depth Analysis Using LIWC Chanjun Park, Midan Shim, Sugyeong Eo, Seolhwa Lee, Jaehyung Seo, Hyeonseok Moon, Heuiseok Lim *Applied Sciences* 12.11 (2022) p. 5545. Multidisciplinary Digital Publishing Institute
- A New Tool for Efficiently Generating Quality Estimation Datasets Sugyeong Eo, Chanjun Park, Jaehyung Seo, Hyeonseok Moon, Heuiseok Lim NeurIPS 2021 - Data-centric AI (DCAI) workshop
- **Comparative Analysis of Current Approaches to Quality Estimation for Neural Machine Translation** Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim *Applied Sciences* 11.14 (2021) p. 6584. Multidisciplinary Digital Publishing Institute

#### Dealing with the Paradox of Quality Estimation

Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim MT Summit - Proceedings of the 4th Workshop on Technologies for MT of Low Resource Languages (LoResMT2021), Virtual

- Automatic Knowledge Augmentation for Generative Commonsense Reasoning Jaehyung Seo, Chanjun Park, Sugyeong Eo, Hyeonseok Moon, Heuiseok Lim NeurIPS 2021 - Data-centric AI (DCAI) workshop
- Grounded Vocabulary for Image Retrieval Using a Modified Multi-Generator Generative Adversarial Network Kuekyeng Kim, Chanjun Park, Jaehyung Seo, Heuiseok Lim IEEE Access (2021). IEEE
- An Empirical Study on Automatic Post Editing for Neural Machine Translation Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Jaehyung Seo, Heuiseok Lim IEEE Access 9 (2021) pp. 123754–123763. IEEE
- **BTS: Back TranScription for Speech-to-Text Post-Processor using Text-to-Speech-to-Text** Chanjun Park, **Jaehyung Seo**, Seolhwa Lee, Chanhee Lee, Hyeonseok Moon, Sugyeong Eo, Heuiseok Lim *ACL 2021 - Proceedings of the 8th Workshop on Asian Translation (WAT2021)*, Online

How should human translation coexist with NMT? Efficient tool for building high quality parallel corpus

### Honors & Awards\_

2023.10	Best Paper Award, 2023, The 35th Annual Conference on Human & Cognitive Language Technology	South Korea
2022.12	NAVER PH.D Fellowship Award, 2022, Scholarship Award	South Korea
2022.12	1st place in WMT 2022 QE Task 3, 2022, WMT 2022 - EMNLP 2022	Abu Dhabi
2022.10	Best Paper Award, 2022, The 34th Annual Conference on Human & Cognitive Language Technology	South Korea
2021.10	Best Paper Award, 2021, The 33rd Annual Conference on Human & Cognitive Language Technology	South Korea
2021.07	4th Place in CommonGen 1.1 Leaderboard, 2021, CommonGen 1.1 Leaderboard	World Record

### Selected Research Experience

#### **KOREA University**

#### RESEARCH IN REASONING AND GENERATION RESEARCH

- KoCommonGEN v2: A Benchmark for Navigating Korean Commonsense Reasoning Challenges in Large Language Models
- CHEF in the Language Kitchen: A Generative Data Augmentation Leveraging Korean Morpheme Ingredients
- CReTIHC: Designing Causal Reasoning Tasks about Temporal Interventions and Hallucinated Confoundings
- Knowledge Graph-Augmented Korean Generative Commonsense Reasoning
- SRLev-BIH: An Evaluation Metric for Korean Generative Commonsense Reasoning
- Ko-ATOMIC: Korean Commonsense Knowledge Graph
- KommonGen: A Dataset for Korean Generative Commonsense Reasoning Evaluation
- Automatic Knowledge Augmentation for Generative Commonsense Reasoning
- Publication of research paper in EMNLP 2023: https://aclanthology.org/2023.emnlp-main.367/
- Publication of research paper in EMNLP-findings 2023: https://aclanthology.org/2023.findings-emnlp.693/
- Publication of research paper in NAACL 2022: https://aclanthology.org/2022.findings-naacl.172/
- Publication of research paper in Knowledge-Based Systems 2022: https://doi.org/10.1016/j.knosys.2022.109861
- Skills: Commonsense Reasoning, Pytorch, Huggingface

#### (Project) Next-Generation AI Technology Development - Hallucination

• Skills. Natural language processing, Pytoren, Hugginglace (Project) Industry-Academia-Government Collaboration R&D: AI Interviewing	Seoul, South Korea
<ul> <li>RESEARCHER AT KOREA UNIV</li> <li>Supported by O2O</li> <li>Skills: Natural language processing, Pytorch, Huggingface</li> </ul>	Seoul, South Korea June. 2022 May. 2023.
(Project) R&D Voucher: Al Contact Center	Seoul, South Korea
<ul> <li>(Project) UI/UX Artificial Intelligence Service Development</li> <li>RESEARCHER AT KOREA UNIV</li> <li>Supported by Samsung Fire &amp; Marine Insurance</li> <li>Skills: Natural language generation, Large language modeling, App application</li> </ul>	Seoul, South Korea June. 2023 Feb. 2024.
<ul> <li>(Project) Open Ko-LLM Leaderboard</li> <li>RESEARCHER AT KOREA UNIV</li> <li>Supported by Upstage</li> <li>Skills: Large language model, Commonsense Reasoning, Evaluation</li> </ul>	Seoul, South Korea Sep. 2023 Dec. 2023
<ul> <li>(Project) Large Language Modeling for Special Technical Documents</li> <li>PROJECT MANAGER AT KOREA UNIV</li> <li>Supported by GAON</li> <li>Skills: Large language modeling, RAG</li> </ul>	Seoul, South Korea Dec. 2023 June. 2024
<ul> <li>PROJECT MANAGER AT KOREA UNIV</li> <li>Supported by IITP</li> <li>Skills: Large language model, Hallucination detection/mitigation</li> </ul>	Jan. 2024 Dec. 2026

RESEARCHER AT KOREA UNIV

- Supported by Withmind
- Skills: Natural language processing, Pytorch, Huggingface

June, 2022, - May, 2023,

Seoul, South Korea

June. 2021. - Present

Seoul, South Korea

#### **KOREA University**

#### Research in Grammatical Error Correction

- Uncovering the Risks and Drawbacks Associated with the Use of Synthetic Data for Grammatical Error Correction
- Synthetic Alone: Exploring the Dark Side of Synthetic Data for Grammatical Error Correction
- K-nct: Korean neural grammatical error correction gold-standard test set using novel error type classification criteria
- Publication of research paper in IEEE Access (SCIE): https://ieeexplore.ieee.org/abstract/document/9938990
- Publication of research paper in IEEE Access (SCIE): https://ieeexplore.ieee.org/abstract/document/10234394/
- Publication of research paper in ICML 2023 Workshop: https://arxiv.org/abs/2306.14377
- Skills: Graph Neural Network, Pytorch, Fairseq

#### (Project) Data Augmentation with Language Generation Research

Project Manager at KOREA Univ

- Supported by Samsung Research
- Skills: Data augmentation, Generation, Pytorch, Huggingface

#### (Project) Korean-Prompt-based Engineering for Few-shot Research

#### PROJECT MANAGER AT KOREA UNIV

- Plain Template Insertion: Korean-Prompt-based Engineering for Few-shot Learners
- Supported by Hyundai Motor
- Publication of research paper in IEEE Access (SCIE): https://ieeexplore.ieee.org/document/9913979
- Skills: Prompt learning, Few-shot learning, Pytorch, Huggingface

#### (Project) Return on Advertising Spend (ROAS) Prediction Research

#### Researcher at KOREA Univ

- Return on Advertising Spend (ROAS) refers to the ratio of revenue generated by advertising projects to its expense.
- We present a method for predicting ROAS that does not require controlled experiments in data acquisition and validates its effectiveness through comparative experiments. Specifically, we propose a task deposition method that divides the end-to-end prediction task into the two-stage process; occurrence prediction and occurred ROAS regression.
- Supported by Data voucher
- Publication of research paper in Mathematics (SCIE): https://www.mdpi.com/2227-7390/10/10/1637
- Skills: ROAS, Regression, Pytorch

#### (Project) Hybrid Retriever System for Industrial Frequently Asked Questions Research

PROJECT MANAGER AT KOREA UNIV

- We propose a method of returning responses to customer inquiries using only data that can be easily obtained from companies based on the deep learning information retrieval module. In this work, we hybridize dense embedding and sparse embedding to make it robust to professional terms and suggest new functions to scale the results returned by the two modules and adjust the weight ratio.
- Supported by Data voucher
- Publication of research paper in Mathematics (SCIE): https://www.mdpi.com/2227-7390/10/8/1335
- Skills: Information Retrieval, Pytorch

#### **KOREA University**

#### RESEARCH IN FAKE NEWS DETECTION RESEARCH

- Research for Utilization Strategy of User Engagements in Korean Fake News Detection
- Publication of research paper in IEEE Access (SCIE): https://ieeexplore.ieee.org/document/9841541
- Skills: Graph Nerual Network, Pytorch, Fairseq

#### (Project) NAVER PAPAGO - Parallel Corpus Filtering and Mining

#### Researcher at KOREA Univ

- Research for Static and Dynamic Parallel Corpus Filtering and Mining
- Human-inspired curriculum learning based NMT
- Supported by NAVER PAPAGO
- Skills: Neural Machine Translation, Parallel corpus filtering, Pytorch, Fairseq

#### KOREA University

#### Research in Data-centric Neural Machine Translation

- Length-aware Byte Pair Encoding for Mitigating Over-segmentation in Korean Machine Translation
- Doubts on the reliability of parallel corpus filtering
- Research for Data-centric Neural Machine Translation, Automatic Post Editing, Quality Estimation, Generative Commonsense Reasoning
- Develop Efficient tool for building high-quality parallel corpus and A New Tool for Efficiently Generating Quality Estimation Datasets and A Self-Supervised Automatic Post-Editing Data Generation Tool
- Publication of research paper in Expert Systems with Applications 2023: https://doi.org/10.1016/j.eswa.2023.120962
- Publication of 3 research paper in NeurIPS 2021 Data-centric AI (DCAI) workshop: https://eval.how/dcai2021/index.html
- Publication of research paper in ICML 2022 DataPerf workshop: https://sites.google.com/view/dataperf2022
- Skills: Neural Machine Translation, Web Application, Fairseq

Seoul, South Korea May. 2022. - April. 2023.

Seoul, South Korea March. 2021. - April. 2022.

#### Seoul, South Korea

December. 2021. - March. 2022.

### Seoul, South Korea

January. 2022. - Present

### Seoul, South Korea

December. 2021. - June. 2022.

#### Seoul, South Korea

July. 2021. - December. 2023.

Seoul, South Korea

December. 2021. - March. 2022.

#### **KOREA University**

Research in Image Retrieval Research

- Grounded Vocabulary for Image Retrieval Using a Modified Multi-Generator Generative Adversarial Network
- Publication of research paper in IEEE Access (SCIE): https://ieeexplore.ieee.org/document/9585128
- Skills: Image Retrieval, Pytorch, Huggingface

#### (Project) Korean Multi-turn Response Chat-bot Research

Project Manager at KOREA Univ

- Supported by Samsung SDS
- A study on Korean multi-turn response generation using generative and retrieval model: https://doi.org/10.15207/JKCS.2022.13.01.013
- Skills: Dialogue System, Natural language generation, Pytorch, Huggingface

#### **KOREA University**

#### Research in Speech recognition post-processor Research

- Proposed BackTranScription(BTS). Back Transcription (BTS) has seen limited success without the role of phonetic transcription for building and creating vast datasets automatically.
- KEBAP: Korean Error Explainable Benchmark Dataset for ASR and Post-processing
- Publication of research paper in EACL 2024
- Publication of research paper in EMNLP 2023: https://aclanthology.org/2023.emnlp-main.292/
- Publication of research paper in WAT 2021 (ACL Workshop): https://aclanthology.org/2021.wat-1.10/
- Publication of research paper in Mathematics: https://www.mdpi.com/2227-7390/10/19/3618
- Skills: Neural Machine Translation, Pytorch, Huggingface, Fairseq

#### **KOREA University**

#### RESEARCH IN AUTOMATIC POST EDITING RESEARCH

- APE research based on Cross Lingual Pretrained Language Model
- Adpater-based APE research
- Publication of research paper in IEEE Access (SCIE): https://ieeexplore.ieee.org/document/9528385/
- Research for Efficient and Simple Data Generation Method Low Resource APE and Pseudo APE data generation
- Publication of research paper in IEEE Access (SCIE): https://ieeexplore.ieee.org/document/9714400
- Research for Synthetic Data Generation Using Noising Strategies for Automatic Post-editing
- Publication of research paper in LREC 2022: http://www.lrec-conf.org/proceedings/lrec2022/pdf/2022.lrec-1.93.pdf
- Skills: Neural Machine Translation, Pytorch, Automatic Post Editing, Huggingface, Fairseq

#### **KOREA University**

#### RESEARCH IN QUALITY ESTIMATION RESEARCH

- Large Scale PLM based Quality Estimation development and research
- Low Resource QE and Pseudo QE data generation
- Publication of research paper in Applied Science (SCIE): https://www.mdpi.com/2076-3417/11/14/6584
- Publication of research paper in MT Summit 2021 LoresMT Workshop: https://aclanthology.org/2021.mtsummit-loresmt.1/
- Publication of research paper in IEEE Access: https://ieeexplore.ieee.org/document/9761258
- Publication of research paper in COLING 2022: https://aclanthology.org/2022.coling-1.460.pdf
- 1st place in WMT 2022 QE Task 3: KU X Upstage's submission for the WMT22 Quality Estimation: Critical Error Detection Shared Task
- Skills: Neural Machine Translation, Pytorch, Quality Estimation, OpenKiwi, Huggingface, Fairseq

#### **KOREA University**

#### Research in AI for Education Research

- PEEP-Talk: Deep Learning-based English Education Platform for Personalized Foreign Language Learning
- Al student: A Machine Reading Comprehension System for the Korean College Scholastic Ability Test
- BERTOEIC: Solving TOEIC Problems Using Simple and Efficient Data Augmentation Techniques with Pretrained Transformer Encoders
- Publication of research paper in ACL 2023 (Demo-track): https://aclanthology.org/2023.acl-demo.18/
- Publication of research paper in Mathematics (SCIE): https://www.mdpi.com/2227-7390/10/9/1486
- Publication of research paper in Applied Sciences (SCIE): https://www.mdpi.com/2076-3417/12/13/6686
- Skills: Pytorch, Python, Google Cloud Platform, REST API, Nao Toolkit

#### **KOREA University**

#### RESEARCH IN AI FOR ACCESSIBILITY RESEARCH

- PicTalky: Design of augmentative alternative communication (AAC) software for children with developmental disabilities
- Publication of research paper in AACL 2022 Demo Track
- Skills: Pytorch, Python, Google Cloud Platform, REST API, Nao Toolkit

### (Project) A Study on the Improvement of Understanding of Korean-based Generative Models

Researcher at KOREA Univ

- Supported by National Security Research Institute
- Skills: Language modeling, Natural language generation

May. 2021. - January. 2022.

Seoul, South Korea

#### Seoul, South Korea

#### January. 2021. - Present

Seoul, South Korea

January. 2021. - Present

Seoul, South Korea

January. 2021. - Present

Seoul, South Korea

September. 2020. - Present

#### Seoul, South Korea

September. 2020. - Present

### Seoul, South Korea

July. 2020. - March. 2021

Skills\_\_\_\_\_

Programming	Python
Machine Learning & Deep Learning	Pytorch, Pytorch lightning, Tensorflow
Natural Language Processing	Commonsense Reasoning, Machine Translation, Language Generation, Information Retrieval
GPU server Build & Management	Linux configuration and engineering, NAS, MLOps, GPU parallelization, Networking, RAID
OS	Linux, Ubuntu, Centos, MAC, Windows, Docker
Language Skills	Korean, English

### Patents\_\_\_\_\_

2023.12	DEVICE AND METHOD FOR KOREAN DATA AUGMENTATION BASED ON CONTRASTIVE LEARNING AND	South Korea
	MORPHEME COMBINATION, Patent Application (10-2023-0189496)	oodannored
2023.10	APPARATUS AND METHOD FOR GENERATING LANGUAGE BASED ON COMMONSENSE REASONING,	South Korea
	Granted Patent (10-2593463)	
2023.03	GENERATING METHOD OF MODEL MEASURING DOCUMENT SIMILARITY AND MEASURING METHOD FOR	South Korea
	DOCUMENT SIMILARITY USING THE SAME, Granted Patent (10-2507192)	
2022.10	DEVICE AND METHOD FOR GENERATING KOREAN COMMONSENSE REASONING DATASET, Patent	South Korea
2022.10	Application (10-2022-0132373)	
2021.11	APPARATUS OF OBTAINING RESPONSE BASED ON SEMANTIC SIMILARITY AND METHOD THEREOF,	South Korea
	Patent Application (10-2021-0156653)	

### Invited Talk & Teaching Experience

Dongguk University Invited Advisor Introduction to Natural Language Dracescing and Commensence Descening	South Korea Jun. 2023
<ul> <li>Introduction to Natural Language Processing and Commonsense Reasoning</li> <li>NongHyup Bank Co., Ltd</li> <li>INVITED ADVISOR</li> <li>Teaching data science for new employees</li> </ul>	South Korea Jul. 2020 - Sep. 2020
Korea University TEACHING ASSISTANT • (DFE615-00) Natural Language Processing for Artificial Intelligence	South Korea Mar - Jun. 2023
<ul> <li>Korea University</li> <li>TEACHING ASSISTANT</li> <li>(DFE610) Natural Language Processing for Digital Finance Engineering</li> <li>Lecture materials: https://github.com/nlpai-lab/nlp-bible-code</li> </ul>	South Korea Sep - Dec. 2022
Korea University TEACHING ASSISTANT • (BDC101) Introduction to Natural Language Processing in Big Data • Lecture materials: https://github.com/J-Seo/BDC103_IR	South Korea Mar - Jun. 2022
Korea University RESEARCH ASSISTANT • (DFE610) Natural Language Processing for Digital Finance Engineering • Lecture materials: https://github.com/nlpai-lab/nlp-bible-code	South Korea Sep - Dec. 2021
Korea University         TEACHING ASSISTANT         • (BDC101) Introduction to Natural Language Processing in Big Data         • Lecture materials: https://github.com/J-Seo/BDC103_IR	South Korea Mar - Jun. 2021

## All Publications \_\_\_\_\_

#### Preprints

Language Chameleon: Transformation analysis between languages using Cross-lingual Post-training based on Pre-trained language models

Suhyune Son, Chanjun Park, Jungseob Lee, Midan Shim, Chanhee Lee, Yoonna Jang, **Jaehyung Seo**, Heuiseok Lim *arXiv preprint arXiv:2209.06422* (2022)

#### TOP CONFERENCE

**KNOTICED:** Augmentative and Alternative Communication Software for Language Developmental Disabilities Sugyeong Eo, Jungwoo Lim, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim

LREC-COLING 2024 - The Joint International Conference on Computational Linguistics, Language Resources and Evaluation

KoCommonGEN v2: A Benchmark for Navigating Korean Commonsense Reasoning Challenges in Large Language Models

Jaehyung Seo, Jaewook Lee, Chanjun Park, SeongTae Hong, Seungjun Lee, Heuiseok Lim

ACL 2024 - Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics

Length-aware Byte Pair Encoding for Mitigating Over-segmentation in Korean Machine Translation Jungseob Lee, Hyeonseok Moon, Seungjun Lee Chanjun Park, Sugyeong Eo, Hyunwoong Ko, **Jaehyung Seo**, Seungyoon Lee, Heuiseok Lim

ACL 2024 - Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics

- Leveraging Pre-existing Resources for Data-Efficient Counter-Narrative Generation in Korean Seungyoon Lee, Chanjun Park, DaHyun Jung, Hyeonseok Moon, Jaehyung Seo, Sugyeong Eo, Heuiseok Lim LREC-COLING 2024 - The Joint International Conference on Computational Linguistics, Language Resources and Evaluation
- Generative Interpretation: Toward Human-Like Evaluation for Educational Question-Answer Pair Generation Hyeonseok Moon, Jaewook Lee, Sugyeong Eo, Chanjun Park, Jaehyung Seo, Heuiseok Lim EACL 2024 - Findings of the Association for Computational Linguistics
- Hyper-BTS Dataset: Scalability and Enhanced Analysis of Back TranScription (BTS) for ASR Post-Processing Chanjun Park, Jaehyung Seo, Seolhwa Lee, Junyoung Son, Hyeonseok Moon, Sugyeong Eo, Chanhee Lee, Heuiseok Lim EACL 2024 - Findings of the Association for Computational Linguistics
- **CRETIHC: Designing Causal Reasoning Tasks about Temporal Interventions and Hallucinated Confoundings Changwoo Chun, SongEun Lee, Jaehyung Seo, Heui-Seok Lim** *EMNLP 2023 - Findings of the Association for Computational Linguistics*
- CHEF in the Language Kitchen: A Generative Data Augmentation Leveraging Korean Morpheme Ingredients Jaehyung Seo, Hyeonseok Moon, Jaewook Lee, Sugyeong Eo, Chanjun Park, Heuiseok Lim EMNLP 2023 - Proceedings of the Conference on Empirical Methods in Natural Language Processing
- Informative Evidence-guided Prompt-based Fine-tuning for English-Korean Critical Error Detection Dahyun Jung, Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heui-Seok Lim IJCNLP-AACL 2023 - Proceedings of the 13th International Joint Conference on Natural Language Processing and the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics
- **KEBAP: Korean Error Explainable Benchmark Dataset for ASR and Post-processing** Seonmin Koo, Chanjun Park, Jinsung Kim, **Jaehyung Seo**, Sugyeong Eo, Hyeonseok Moon, Heui-Seok Lim *EMNLP 2023 - Proceedings of the Conference on Empirical Methods in Natural Language Processing*
- PEEP-Talk: A Situational Dialogue-based Chatbot for English Education Seungjun Lee, Yoonna Jang, Chanjun Park, Jungseob Lee, **Jaehyung Seo**, Hyeonseok Moon, Sugyeong Eo, Seounghoon Lee, Bernardo Yahya, Heui-Seok Lim

ACL 2023 - Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 3: System Demonstrations)

- QUAK: A Synthetic Quality Estimation Dataset for Korean-English Neural Machine Translation Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Gyeongmin Kim, Jungseob Lee, Heui-Seok Lim COLING 2022 - Proceedings of the 29th International Conference on Computational Linguistics
- A Dog Is Passing Over The Jet? A Text-Generation Dataset for Korean Commonsense Reasoning and Evaluation Jaehyung Seo, Seounghoon Lee, Chanjun Park, Yoonna Jang, Hyeonseok Moon, Sugyeong Eo, Seonmin Koo, Heuiseok Lim NAACL 2022 - Findings of the Association for Computational Linguistics, Seattle, United States
- **PicTalky: Augmentative and Alternative Communication Software for Language Developmental Disabilities** Chanjun Park, Yoonna Jang, Seolhwa Lee, **Jaehyung Seo**, Kisu Yang, Heuiseok Lim *IJCNLP-AACL 2022 - The 2nd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics*

#### Priming Ancient Korean Neural Machine Translation

Chanjun Park, Seolhwa Lee, Jaehyung Seo, Hyeonseok Moon, Sugyeong Eo, Heuiseok Lim *LREC 2022 - Proceedings of the Language Resources and Evaluation Conference*, Marseille, France

#### INTERNATIONAL JOURNAL

Uncovering the Risks and Drawbacks Associated with the Use of Synthetic Data for Grammatical Error Correction

Seonmin Koo, Chanjun Park, Seolhwa Lee, **Jaehyung Seo**, Sugyeong Eo, Hyeonseok Moon, Heuiseok Lim

#### A Survey on Evaluation Metrics for Machine Translation

Seungjun Lee, Jungseob Lee, Hyeonseok Moon, Chanjun Park, **Jaehyung Seo**, Sugyeong Eo, Seonmin Koo, Heuiseok Lim Mathematics 11.4 (2023) p. 1006. MDPI

#### Doubts on the reliability of parallel corpus filtering

Hyeonseok Moon, Chanjun Park, Seonmin Koo, Jungseob Lee, Seungjun Lee, **Jaehyung Seo**, Sugyeong Eo, Yoonna Jang, Hyunjoong Kim, Hyoung-gyu Lee

Expert Systems with Applications 233 (2023) p. 120962. Elsevier

Word-level Quality Estimation for Korean-English Neural Machine Translation Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim *IEEE Access* 10 (2022) pp. 44964–44973. IEEE

55 10 (2022) pp. 11501 11515.1EEE

#### Dense-to-Question and Sparse-to-Answer: Hybrid Retriever System for Industrial Frequently Asked Questions

Jaehyung Seo, Taemin Lee, Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Imatitikua D Aiyanyo, Kinam Park, Aram So, Sungmin Ahn, Jeongbae Park

Mathematics 10.8 (2022) p. 1335. MDPI

#### Plain Template Insertion: Korean-Prompt-Based Engineering for Few-Shot Learners

Jaehyung Seo, Hyeonseok Moon, Chanhee Lee, Sugyeong Eo, Chanjun Park, Jihoon Kim, Changwoo Chun, Heuiseok Lim IEEE Access 10 (2022) pp. 107587–107597

**PU-GEN: Enhancing generative commonsense reasoning for language models with human-centered knowledge Jaehyung Seo**, Dongsuk Oh, Sugyeong Eo, Chanjun Park, Kisu Yang, Hyeonseok Moon, Kinam Park, Heuiseok Lim *Knowledge-Based Systems* (2022) p. 109861. Elsevier

#### Research on Utilization Strategy of User Engagements in Korean Fake News Detection

Myunghoon Kang, Jaehyung Seo, Chanjun Park, Heuiseok Lim *IEEE Access* (2022) pp. 1–1

BERTOEIC: Solving TOEIC Problems Using Simple and Efficient Data Augmentation Techniques with Pretrained Transformer Encoders

Jeongwoo Lee, Hyeonseok Moon, Chanjun Park, Jaehyung Seo, Sugyeong Eo, Heuiseok Lim Applied Sciences 12.13 (2022) p. 6686. Multidisciplinary Digital Publishing Institute

#### Return on Advertising Spend Prediction with Task Decomposition-Based LSTM Model

Hyeonseok Moon, Taemin Lee, **Jaehyung Seo**, Chanjun Park, Sugyeong Eo, Imatitikua D Aiyanyo, Jeongbae Park, Aram So, Kyoungwha Ok, Kinam Park

Mathematics 10.10 (2022) p. 1637. MDPI

#### An Automatic Post Editing with Efficient and Simple Data Generation Method Hyeonseok Moon, Chanjun Park, Jaehyung Seo, Sugyeong Eo, Heuiseok Lim IEEE Access (2022). IEEE

- The ASR Post-Processor Performance Challenges of BackTranScription (BTS): Data-Centric and Model-Centric Approaches Chanjun Park, Jaehyung Seo, Seolhwa Lee, Chanhee Lee, Heuiseok Lim *Mathematics* 10.19 (2022)
- Comparative Analysis of Current Approaches to Quality Estimation for Neural Machine Translation Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim Applied Sciences 11.14 (2021) p. 6584. Multidisciplinary Digital Publishing Institute
- Grounded Vocabulary for Image Retrieval Using a Modified Multi-Generator Generative Adversarial Network Kuekyeng Kim, Chanjun Park, Jaehyung Seo, Heuiseok Lim IEEE Access (2021). IEEE

An Empirical Study on Automatic Post Editing for Neural Machine Translation Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Jaehyung Seo, Heuiseok Lim *IEEE Access* 9 (2021) pp. 123754–123763. IEEE

#### DOMESTIC JOURNAL

#### Policy-based performance comparison study of Real-time Simultaneous Translation Jungseob Lee, Hyeonseok Moon, Chanjun Park Jaehyung Seo, Sugyeong Eo, Seungjun Lee, Seonmin Koo, Heuiseok Lim Journal of the Korea Convergence Society 13.3 (2022) pp. 43–54. Korea Convergence Society

Error Analysis of Recent Conversational Agent-based Commercialization Education Platform Seungjun Lee, Chanjun Park, Jaehyung Seo, Heuiseok Lim Journal of the Korea Convergence Society 13.3 (2022) pp. 11–22. Korea Convergence Society

#### Study on Zero-shot based Quality Estimation

Sugyeong Eo, Chanjun Park, Jaehyung Seo, Hyeonseok Moon, Heuiseok Lim Journal of the Korea Convergence Society 12.11 (2021) pp. 35–43. Korea Convergence Society

#### **Research on Recent Quality Estimation**

Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, HeuiSeok Lim Journal of the Korea Convergence Society 12.7 (2021) pp. 37–44. Korea Convergence Society

#### Study on Decoding Strategies in Neural Machine Translation

Jaehyung Seo, Chanjun Park, Sugyeong Eo, Hyeonseok Moon, Heuiseok Lim Journal of the Korea Convergence Society 12.11 (2021) pp. 69–80. Korea Convergence Society

#### **Recent Automatic Post Editing Research**

Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Jaehyung Seo, HeuiSeok Lim Journal of Digital Convergence 19.7 (2021) pp. 199–208. Journal of Digital Convergence

#### The Verification of the Transfer Learning-based Automatic Post Editing Model Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Jaehyung Seo, Heuiseok Lim Journal of the Korea Convergence Society 12.10 (2021) pp. 27–35. Korea Convergence Society

#### A Study on Verification of Back TranScription(BTS)-based Data Construction Chanjun Park, Jaehyung Seo, Seolhwa Lee, Hyeonseok Moon, Sugyeong Eo, Heuiseok Lim Journal of the Korea Convergence Society 12.11 (2021) pp. 109–117. Korea Convergence Society

#### **DOMESTIC CONFERENCE**

#### Word-level Korean-English Quality Estimation

Sugyeong Eo, Chanjun Park, Jaehyung Seo, Heonseok Moon, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology

KommonGen: A Dataset for Korean Generative Commonsense Reasoning Evaluation (Best Paper Award) Jaehyung Seo, Chanjun Park, Heonseok Moon, Sugyeong Eo, Myunghoon Kang, Seounghoon Lee, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology

#### Persona-based Korean Conversational Model

Yoonna Jang, Jungwoo Lim, Yuna Hur, Kisu Yang, Chanjun Park, Jaehyung Seo, Seungjun Lee, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology

- Proposal of Automated Essay Scoring Method based on Deep-Learning Yujin Kim, Chanjun Park, Seolhwa Lee, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology
- Model Training and Data Augmentation Schemes For the High-level Machine Reading Comprehension Jeongwoo Lee, Hyeonseok Moon, Chanjun Park, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology
- **Comparative study of Korean speech recognition based on SpecAugment and Kaldi** Seounghoon Lee, Chanjun Park, **Jaehyung Seo**, Gyeongmin Kim, HeuiSeok Lim *The 33rd Annual Conference on Human & Cognitive Language Technology*
- Verification of the Domain Specialized Automatic Post Editing Model Heonseok Moon, Chanjun Park, Jaehyung Seo, Sugyeong Eo, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology
- **BackTranScription (BTS)-based Jeju Automatic Speech Recognition Post-processor Research** Chanjun Park, **Jaehyung Seo**, Seolhwa Lee, Heonseok Moon, Sugyeong Eo, Yoonna Jang, HeuiSeok Lim *The 33rd Annual Conference on Human & Cognitive Language Technology*

**Categorization and Analysis of Error Types in the Korean Speech Recognition System (Best Paper Award)** Junyoung Son, Chanjun Park, Jaehyung Seo, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology

- Attention Patterns and Semantics of Korean Language Models Kisu Yang, Yoonna Jang, Jingwoo Lim, Chanjun Park, Hwanseok Jang, HeuiSeok Lim The 33rd Annual Conference on Human & Cognitive Language Technology
- MMA: Multi-modal Message Aggregation for Korean VQA Sungjin Park, Chanjun Park, Jaehyung Seo, HeuiSeok Lim The 32st Annual Conference on Human & Cognitive Language Technology

#### Workshop

- Knowledge Graph-Augmented Korean Generative Commonsense Reasoning Dahyun Jung, Jaehyung Seo, Jaewook Lee, Chanjun Park, Heuiseok Lim ICML-DMLR workshop (2023)
- Synthetic Alone: Exploring the Dark Side of Synthetic Data for Grammatical Error Correction Chanjun Park, Seonmin Koo, Seolhwa Lee, **Jaehyung Seo**, Sugyeong Eo, Hyeonseok Moon, Heuiseok Lim ICML-DMLR workshop (2023)
- Focus on FoCus: Is FoCus focused on Context, Knowledge and Persona? SeungYoon Lee, Jungseob Lee, Chanjun Park, Sugyeong Eo, Hyeonseok Moon, Jaehyung Seo, Jeongbae Park, Heui-Seok Lim COLING 2022 - Proceedings of the 1st Workshop on Customized Chat Grounding Persona and Knowledge
- A Self-Supervised Automatic Post-Editing Data Generation Tool Hyeonseok Moon, Chanjun Park, Sugyeong Eo, Jaehyung Seo, SeungJun Lee, Heuiseok Lim ICML 2022 - DataPerf workshop (2022)
- A New Tool for Efficiently Generating Quality Estimation Datasets Sugyeong Eo, Chanjun Park, Jaehyung Seo, Hyeonseok Moon, Heuiseok Lim NeurIPS 2021 - Data-centric AI (DCAI) workshop

#### Dealing with the Paradox of Quality Estimation Sugyeong Eo, Chanjun Park, Hyeonseok Moon, Jaehyung Seo, Heuiseok Lim MT Summit - Proceedings of the 4th Workshop on Technologies for MT of Low Resource Languages (LoResMT2021), Virtual

- Automatic Knowledge Augmentation for Generative Commonsense Reasoning Jaehyung Seo, Chanjun Park, Sugyeong Eo, Hyeonseok Moon, Heuiseok Lim NeurIPS 2021 - Data-centric AI (DCAI) workshop
- **BTS: Back TranScription for Speech-to-Text Post-Processor using Text-to-Speech-to-Text** Chanjun Park, **Jaehyung Seo**, Seolhwa Lee, Chanhee Lee, Hyeonseok Moon, Sugyeong Eo, Heuiseok Lim *ACL 2021 - Proceedings of the 8th Workshop on Asian Translation (WAT2021)*, Online
- How should human translation coexist with NMT? Efficient tool for building high quality parallel corpus Chanjun Park, Seolhwa Lee, Hyeonseok Moon, Sugyeong Eo, Jaehyung Seo, Heuiseok Lim NeurIPS 2021 - Data-centric AI (DCAI) workshop (2021)