Changhun Lee

PH.D. · POST-DOCTORAL RESEARCHER · UNIST AIGS

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Education

PH.D. INDUSTRIAL ENGINEERING   *2016.03 - 2023.02*
- Advisor: Dr. Chiehyeon Lim
- Dissertation Title:
  "Tackling Three Problems in Controlled Sequence Generations: Bridging Reinforcement Learning with Language Models"

BSC. ECONOMICS   *2011.03 - 2015.02*

Professional Experience

2023.03-Present	**Postdoctoral Researcher**, Graduate School of Artificial Intelligence, UNIST
2019-2022	**Principal Investigator**, Granted Research Program, Daewoong Pharmaceutics Foundation
2021.11-2021.12	**Research Advisor**, Project-based Learning Program, LG Electronics
2018-2019	**Co-founder**, Data Team, Smart Ship Venture Tech
2017.07-2017.12	**Data Analyst**, Business Planning Department, Hyundai Mipo Dockyard
2016-2017	**Graduate Teaching Assistant**, Department of Industrial Engineering, UNIST

Awards, Fellowships, & Grants

2023	**UNIST Best Research Award**, Ulsan National Institute of Science and Technology
2022	**Prominent Presentation Award**, The Korean Nutrition Society
	Best Oral Presentation Award, Korean Academy of Pediatric Allergy and Respiratory Disease
2020	**Best Poster Presentation Award**, The Korean Nutrition Society
2018	**Minister of Science and ICT Award**, Korea Institute of Science and Technology
	Daewoong Research Scholarship Grant, Daewoong Pharmaceutics Foundations
2013	**Student Best Paper Award**, Korean Association for Policy Sciences

Publications

CONFERENCE PAPERS

Changhun, Lee., Chiehyeon Lim. (2023). "Theoretical Principles of Controllable Generation: Reinforcing the Levenshtein Agent Mitigates the Discrepancy Problem," *To be submitted to AAAI'24 or ICLR'24*

Changhun, Lee., Chiehyeon Lim. (2023). "Analyzing the Controllability of Language Models and Improving the Control Performance with Reward Dropout," *Under Review in EMNLP'23*

Jongkyung Shin.*, **Changhun, Lee.***, Chiehyeon Lim., Yunmo Shin., Junseok Lim. (2022). "Recommendation in Offline Stores: A Gamification Approach for Learning the Spatiotemporal Representation of Indoor Shopping," *In Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (pp. 3878-3888).*

Changhun, Lee., Soohyeok Kim., Sehwa Jeong., Chiehyeon Lim., Jayun Kim., Yeji Kim., Minyoung Jung. (2021). "MIND dataset for diet planning and dietary healthcare with machine learning: Dataset creation using combinatorial opti-

mization and controllable generation with domain experts," *In Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS) Datasets and Benchmarks Track (Round 2).*

Changhun, Lee., Soohyeok Kim., Chiehyeon Lim., Jayun Kim., Yeji Kim., Minyoung Jung.. (2021). "Diet Planning with Machine Learning: Teacher-forced REINFORCE for Composition Compliance with Nutrition Enhancement," *In Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining (pp. 3150-3160).*

Journal Papers

Changhun, Lee., Soohyeok Kim., Sehwa Jeong., Jayun Kim., Yeji Kim., Chiehyeon Lim., Minyoung Jung. (2023). "Artificial intelligence generates allergy-free high-nutrition diets: A first study on the real-world solution development and its evaluation," *To be submitted to Allergy.*

Changhun, Lee., Soohyeok Kim., Jayun Kim., Chiehyeon Lim., Minyoung Jung. (2022). "Challenges of diet planning for children using artificial intelligence," *Nutrition Research and Practice, 16(6), 801-812.*

Changhun, Lee., Chiehyeon Lim. (2021). "From technological development to social advance: A review of Industry 4.0 through machine learning," *Technological Forecasting and Social Change, 167, 120653.*

Min Jung., Chiehyeon Lim., **Changhun, Lee.**, Soohyeok Kim., Jayun Kim. (2020). "Human dietitians vs. Artificial intelligence: Which diet design do you prefer for your children?," *Journal of Allergy and Clinical Immunology, 147(2), AB117.*

Presentations
* presenting author; \+ mentored undergraduate

Contributed Presentations

Sehwa Jeong.[+], Soohyeok Kim, **Changhun, Lee.**, Jayun Kim., Yeji Kim., Chiehyeon Lim., Minyoung Jung.* 2022. Toward the Diet Planning with Artificial Intelligence for Children with Food Allergies. Flash Talk Session: EAACI Hybrid Congress 2022, Prague, Czech Republic

Changhun, Lee.*, Soohyeok Kim., Sehwa Jeong.[+], Chiehyeon Lim., Jayun Kim., Yeji Kim., Minyoung Jung. 2021. MIND dataset for diet planning and dietary healthcare with machine learning: Dataset creation using combinatorial optimization and controllable generation with domain experts. Best Paper Sessions: Korean Artificial Intelligence Association 2021, Virtual

Changhun, Lee., Soohyeok Kim., Jayun Kim., Chiehyeon Lim., Minyoung Jung.* 2021. Human- or Artificial Intelligence-designed Diets: Which Do You Prefer for Your Children? Poster Presentation: AAAAI 2021, Virtual

Research Project

DEVELOP AND VALIDATE A LEARNING FRAMEWORK FOR INTERACTION AND CO-EVOLUTION BETWEEN HUMANS AND AI • Funding Agency: Ministry of Education	*2021 - present*
DEVELOPING INTELLIGENT BIO-OMICS ANALYSIS TECHNOLOGY • Funding Agency: Ministry of SMEs and Startups	*2021 - 2023*
DEVELOP A METHODOLOGY FOR IDENTIFYING LATENT FACTORS EXPLAINING VARIABILITY IN SOCIAL SCIENCE BIG DATA • Funding Agency: Ministry of Education	*2020 - 2022*
DEVELOPMENT OF A NON-FACE-TO-FACE PRECISION DIETARY AI SERVICE SYSTEM TAILORED TO THE GUT FLORA OF PEDIATRIC ATOPIC DISEASES • Funding Agency: Ministry of Science and ICT	*2020-2021*
DEVELOPMENT OF A DATA REORGANIZATION AND RECOMMENDATION SYSTEM TO REDUCE THE COST OF DRUG DISCOVERY • Funding Agency: Daewoong Pharmaceutics Foundation	*2019 - 2022*

STRUCTURAL ANALYSIS OF THE PROCESS OF TECHNOLOGICAL INNOVATION IN THE FOURTH INDUSTRIAL REVOLUTION *2018 - 2021*
- Funding Agency: Ministry of Education

RESEARCH ON SERVITIZATION IN INDUSTRY 4.0 THROUGH REGIONAL INDUSTRIAL-ACADEMIC COOPERATION *2018-2019*
- Funding Agency: Ministry of Science and ICT

UNDERSTAND THE KEY RESEARCH AND APPLICATION INDUSTRIES OF THE FOURTH INDUSTRIAL REVOLUTION *2017-2020*
- Funding Agency: Ulsan National Institute of Science and Technology