Taehun Cha

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Taehun Cha is a Ph.D. candidate at the Department of Mathematics, Korea University. His main research area is Natural Language Processing, sequential decision-making, and mathematically analyzing the current success of PLMs and LLMs.

Education

Ph.D. Candidate in Mathematics – Korea University (Advisor: Donghun Lee)   Mar. 2022 —

M.F.E. in Financial Engineering – Korea University (Advisor: Donghun Lee)   Mar. 2020 — Feb. 2022

- Fully funded student

- Academic Excellence Scholarship for 2021 Spring Semester

- Thesis: Understanding the Yield Curve Shift with FOMC Statements: NLP Perspective

B.A. in Sociology and Cultural Critics – Yonsei University   Mar. 2012 — Aug. 2019

- Minor in Applied Statistics

Work Experience

KT Corp., Ph.D. Student Researcher, Jul. 2023. - Aug. 2023.

- Researched the hallucination problem in large language models (LLM). Built an automatized pipeline to construct a hallucination dataset using ChatGPT and a reward model to train LLM with RL.

- Selected as an outstanding intern.

Publication

Taehun Cha and Donghun Lee. 2025. "Feature Learning as a Virtual Covariance Learning." Optimization for Machine Learning Workshop at Neurips 2025 (**OPT@Neurips 2025**).

Chandler Smith, Marwa Abdulhai, (...), Taehun Cha, (...). 2025. "Evaluating Generalization Capabilities of LLM-Based Agents in Mixed-Motive Scenarios Using Concordia." The Thirty-ninth Annual Conference on Neural Information Processing Systems Datasets and Benchmarks Track, (**Neurips 2025**).

Taehun Cha and Donghun Lee. 2025. "Emergent Linear Separability of Unseen Data Points in Last-Layer Feature Space." Workshop on High-dimensional Learning Dynamics at ICML 2025 (**HiLD@ICML 2025**).

Taehun Cha and Donghun Lee. 2025. "ABC3: Active Bayesian Causal Inference with Cohn Criteria in Randomized Experiments." In The 39th Annual AAAI Conference on Artificial Intelligence (**AAAI 2025, Oral**).

Taehun Cha and Donghun Lee. 2024. "Pre-trained Language Models Return Distinguishable Probability Distributions to Unfaithfully Hallucinated Texts." Findings of the Association for Computational Linguistics: EMNLP 2024 (**EMNLP 2024 Findings**).

Taehun Cha and Donghun Lee. 2024. "Evaluating Extrapolation Ability of Large Language Model in Chemical Domain." Language + Molecules Workshop at ACL 2024. (**Lang+Moles@ACL 2024**)

Taehun Cha and Donghun Lee. 2024. "SentenceLDA: Discriminative and Robust Document Representation with Sentence Level Topic Model." In Proceedings of the 18th Conference of the European Chapter of the Association for Computational Linguistics (**EACL 2024, Oral**).

Taehun Cha and Donghun Lee. 2023. "Predicting U.S. Treasury Yield Curve Shifts with FOMC Statements Using BERT." In Proceedings of the 50th Korea Computer Congress **(KCC 2023)**.

Taehun Cha*, Jaeheun Jung*, and Donghun Lee. 2022. "Noun-MWP: Math Word Problems Meet Noun Answers." In Proceedings of the 29th International Conference on Computational Linguistics **(COLING 2022)**.

Under Review

"Curse of Smoothness in Functional Neural Networks." Under Review.

"Consequence-Guided Information Extraction for Predicting Central Bank Communication's Effect." Under Review.

Awards

Concordia Contest @ Neruips 2024 - First Place out of 197 participants. 2024. Cooperative AI Foundation, Google DeepMind, MIT, UC Berkeley, and UCL.

- Designed and developed an LLM-based AI agent that maximizes expected reward while maintaining a cooperative stance.

AI Grand Challenge - 7nd Place. 2023. Ministry of Science and ICT.

- Designed and led the development of an open-domain, multi-hop, multi-modal, document-based report-generating system (team leader).

AI Grand Challenge Open Track - 2nd Place. 2023. Ministry of Science and ICT.

- Developed an open-domain, multi-hop, multi-modal document QA system and achieved 2nd place out of 12 teams.

Korean AI Competition - 4th Place. 2022. Ministry of Science and ICT.

- Developed an Automatic Speech Recognition model for the Korean language and achieved 4th place out of 103 teams (team leader).

AI Grand Challenge. 2021. Ministry of Science and ICT.

- Developed an NLP model to solve elementary math word problems based on KLUE-RoBERTa, and we were selected for follow-up research (team leader).

HAAFOR NLP Challenge 2020 - 3rd place. 2020. HAAFOR.

- Achieved 3rd place(70.27% accuracy) on text order prediction task with ALBERT model.

K-Cyber Security Challenge 2019 - final round. 2019. KISA.

- Developed a random forest algorithm to predict and detect a cyber attack on automobiles.

Academic Service

- Reviewer for Neurips (2025~)
- Reviewer for ACL Rolling Review (2024~)
- Reviewer for Neural Computing and Applications (2024~)

Grant

Ph.D. Fellowship. 2025. National Research Foundation of Korea (NRF). 25,000,000 KRW (~ 20,000 USD)

- Financial support for research on DNN feature space linear separability.

Junior Fellow-Research Grant. 2023. Korea University. 2,000,000 KRW (~ 1,500 USD)

- Financial support for research on sentence-level topic modeling.

Invited Talks

Understanding Feature Learning: AGOP, RFM, and Virtual Covariance Learning, Korean Mathematical Society Fall Symposium, Korean Mathematical Society, October 22, 2025.

Cooperative AI: Focusing on the Concordia Contest, Cooperative AI Talk, AI Safety Asia, Online, April 10, 2025. `https://www.youtube.com/watch?v=c4bSITHm6Ms`

Extracting Financial Knowledge from FOMC Communications with Reinforcement Learning and Natural Language Processing, The Artificial Intelligence Symposium, Natural Science Research Institute, Gangneung-Wonju National University, June 9, 2023.