Hyunsoo Cho

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RESEARCH INTERESTS

Machine Learning

• Anomaly Detection, Distributional Shift, Self-Supervised Learning, Unsupervised Learning, Weakly-Supervised Learning

Natural Language Processing

• Large-scale Pre-trained Language Model, Prompt Engineering, Parameter-efficient Transfer Learning, In-Context Learning, Natural Language Understanding

EDUCATION

• **Ph.D.** Computer Science and Engineering, Seoul National University   **Mar. 2019 — Feb. 2023**
  – **Advisor:** Sang-goo Lee
  – **Dissertation:** *A Deep Representation Learning for Unsupervised Anomaly Detection.*
  – **Committee:** U Kang, Sang-goo Lee, Seung-won Hwang, Sungzoon Cho (SNU), Taeuk Kim (HYU)

• **M.S.** Computer Science and Engineering, Seoul National University   **Sep. 2016 — Aug. 2018**
  – **Advisor:** Sang-goo Lee
  – **Dissertation:** *Visual Question Answering using Simple Natural Language Processing.*

• **B.S.** Computer Science and Engineering, Chung-ang University   **Mar. 2012 — Aug. 2016**

PUBLICATIONS

Pre-print & Under review

[1] **Effective and Scalable Weakly-Supervised Learning for Black-box Language Models**
Hyunsoo Cho, Youna Kim, Sang-goo Lee.
Under review

[2] **Integrating Two Perspectives on Distributional Shift in Natural Language Understanding.**
Hyuhng Joon Kim, **Hyunsoo Cho**, Sang-Woo Lee, Junyeob Kim, Choonghyun Park, Sang-goo Lee, Kang Min Yoo, Taeuk Kim.
Under review

[3] **Probing Out-of-Distribution Robustness of Language Models with Parameter-Efficient Transfer Learning.**
Hyunsoo Cho, Choonghyun Park, Junyeop Kim, Hyuhng Joon Kim, Kang Min Yoo, Sang-goo Lee.
Pre-print arXiv

International

[1] **Prompt-Augmented Linear Probing: Scaling Beyond The Limit of Few-shot In-Context Learners.**
Hyunsoo Cho, Hyuhng Joon Kim, Junyeob Kim, Sang-Woo Lee, Sang-goo Lee, Kang Min Yoo, Taeuk Kim.
Thirty-Seventh AAAI Conference on Artificial Intelligence **(AAAI 2023)**.

[2] **Ground-Truth Labels Matter: A Deeper Look into Input-Label Demonstrations.**
Kang Min Yoo*, Junyeob Kim*, Hyuhng Joon Kim, **Hyunsoo Cho**, Hwiyeol Jo, Sang-Woo Lee, Sang-goo Lee, Taeuk Kim.
The 2022 Conference on Empirical Methods in Natural Language Processing **(EMNLP Oral 2022)**.

[3] **Enhancing Out-of-Distribution Detection in Natural Language Understanding via Implicit Layer Ensemble.**
Hyunsoo Cho, Choonghyun Park, Jaewook Kang, Kang Min Yoo, Taeuk Kim, Sang-goo Lee.
Findings of the Association for Computational Linguistics: EMNLP 2022 **(Findings of EMNLP 2022)**.

[4] **Self-Generated In-Context Learning: Leveraging Auto-regressive Language Models as a Demonstration Generator.**
Hyuhng Joon Kim, **Hyunsoo Cho**, Junyeob Kim, Taeuk Kim, Kang Min Yoo, Sang-goo Lee
Workshop on Large-scale Pre-trained Language Models **(LPLM 2022)** at NAACL 2022.

[5] **Masked Contrastive Learning for Anomaly Detection.**
Hyunsoo Cho, Jinseok Seol, Sang-goo Lee.
The 30th International Joint Conference on Artificial Intelligence (IJCAI 2021).

[6] **Leveraging Class Hierarchy in Fashion Classification.**
Hyunsoo Cho, Chaemin Ahn, Kang Min Yoo, Jinseok Seol, Sang-goo Lee.
The 2nd Workshop on Computer Vision for Fashion, Art and Design 2019 (CVFAD 2019) at ICCV 2019.

[7] **Stochastic Relational Network.**
Kang Min Yoo, **Hyunsoo Cho**, Hanbit Lee, Jeeseung Han, Sang-goo Lee.
The 1st Workshop on Statistical Deep Learning in Computer Vision 2019 (SDLCV 2019) at ICCV 2019.

[8] **Automatic Generation of Multiple-Choice Fill-in-the-blank Question Using Document Embedding.**
Junghyuk Park, **Hyunsoo Cho**, and Sang-goo Lee.
The 19th International Conference on Artificial Intelligence in Education (AIED 2018).

Domestic

[1] **FastText를 적용한 한국어 단어 임베딩.**
Hyunsoo Cho, Sang-goo Lee.
Korea Software Congress (KSC 2017).

PATENTS

- Anomaly Detection System and Method for Setting Threshold Thereof (international - America, China, Korea)

WORK EXPERIENCE

Naver AI Lab.
- Research Intern   **Apr. 2022 — Aug. 2022**

RESEARCH EXPERIENCE

Enhancing Natural Language Understanding via Pre-trained Language Models
Led by Prof. Sang-goo Lee (PI), with *Naver Corp.*   **Apr. 2021 — Feb. 2023**

- Parameter-efficient transfer learning.
- Prompt optimization.
- Unsupervised Out-of-distribution leveraging pre-trained language models.

An Advanced Study of QA Technologies for Intelligent Assistant System
Led by Prof. Sang-goo Lee (PI), with *Hyundai Motors.*   **Mar. 2020 — Feb. 2021**

- Supervised out-of-Distribution detection in spoken language understanding.
- Enhancing SLU classifier performance.
- Survey on Korean pre-trained language models.

Text and Sentiment Analysis for Fashion Trend Analysis
Led by Prof. Sang-goo Lee (PI), with *Korea Creative Content Agency (KOCCA).*   **Jul. 2019 — Jun. 2020**

- Determining the importance and emotion from collected fashion posting (*e.g.,* likes, emoticons, comments.).
- Extract notable keywords and entity names from the collected fashion posting (*e.g.,* title, comment).
- Devising efficient deep learning-based fashion category classifier.

ACADEMIC SERVICES

Reviewer:

- The Annual Meeting of the Association for Computational Linguistics (**ACL**): 2022, 2023
- The North American Chapter of the Association for Computational Linguistics (**NAACL**): 2022
- The International Conference On Computational Linguistics (**COLING**) : 2022
- The Conference on Empirical Methods in Natural Language Processing (**EMNLP**): 2022
- The Association for the Advancement of Artificial Intelligence (**AAAI**): 2023

Visiting Talks

- Poster presentation - *AIIS Fall Retreat*   **Nov. 2022**
- Invited speaker - *Tech talk, Naver Enterprise*   **Mar. 2022**
- Invited speaker - *Tech talk, Kakao Enterprise*   **Jan. 2022**
- Invited speaker - *Tech talk, Hyperconnect Enterprise*   **Jan. 2022**
- Poster presentation - *AIIS Fall Retreat* (**Best poster**)   **Nov. 2021**
- Invited speaker - *The 2nd Workshop on Artificial Intelligence for Anomalies and Novelties, AI4AN 2021 at IJCAI 2021*   **Aug. 2021**
- Invited speaker - *2018 토대연구 학술회의 <이보형 民俗樂 Odyssey> at Korean Music Society*   **May. 2018**

Teaching Experience

- **Advanced Database**   **Fall. 2019**
  - *Department of Computer Science & Engineering, SNU - TA*
- **Introduction to Databases**   **Fall. 2017**
  - *Department of Computer Science & Engineering, SNU - TA*
- **IT Entrepreneurship**   **Fall. 2017**
  - *Department of Computer Science & Engineering, SNU - TA*
- **Advanced Computer Science Seminar**   **Spring. 2017**
  - *Department of Computer Science & Engineering, SNU - TA*

(Last update. 2023/1/30)