Hyunsoo Cho

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Research Interests

Machine Learning

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

Ongoing Research

[1] **Hyunsoo Cho**. How Large Language Models Cope with Outliers? Probing Out-of-Distribution Robustness via Parameter-Efficient Transfer Learning.

[2] **Hyunsoo Cho**. Few-shot Active Learning for Large-scale Language Models.

International

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

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

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

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

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

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

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

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

Domestic

[1] **Hyunsoo Cho** and Sang-goo Lee. FastText를 적용한 한국어 단어 임베딩. *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

- The Annual Meeting of the Association for Computational Linguistics (**ACL**) : 2022
- 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*

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