Hankook Lee

Ph.D Student @ ALIN Lab in KAIST

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Research Interests

My research goal is to develop efficient and scalable deep learning algorithms that require few or no human annotation, and ultimately apply them to real-world applications with massive data. More specifically, my research interests lie in neural architectures, data augmentations, transfer/few-shot learning and un/self-supervised learning in various domains such as vision, chemistry, and tabular data.

Education

KAIST (Korea Advanced Institute of Science and Technology) *Daejeon, South Korea*
Ph.D. in Electrical Engineering *Sep. 2018 - Present*
- Advisor: Jinwoo Shin

KAIST (Korea Advanced Institute of Science and Technology) *Daejeon, South Korea*
M.Sc. in Electrical Engineering *Mar. 2016 - Aug. 2018*
- Advisor: Jinwoo Shin

KAIST (Korea Advanced Institute of Science and Technology) *Daejeon, South Korea*
B.Sc. in Mathematics and Computer Science (Double major) *Mar. 2010 - Feb. 2016*
- GPA: 3.93/4.3 (Magna Cum Laude)

Publications

C: Conference, W: Workshop, P: Preprint, *: Equal contribution

[C7/W] Improving Transferability of Representations via Augmentation-Aware Self-Supervision *Online*
Hankook Lee, Kibok Lee, Kimin Lee, Honglak Lee, Jinwoo Shin *Dec. 2021*
- Neural Information Processing Systems (NeurIPS), 2021
- International Conference on Machine Learning (ICML) 2021 Workshop: Self-Supervised Learning for Reasoning and Perception

[C6] Self-Improved Retrosynthetic Planning *Online*
Junsu Kim, Sungsoo Ahn, Hankook Lee, Jinwoo Shin *Jul. 2021*
- International Conference on Machine Learning (ICML), 2021

[C5/W] RetCL: A Selection-based Approach for Retrosynthesis via Contrastive Learning *Online*
Hankook Lee, Sungsoo Ahn, Seung-Woo Seo, You Young Song, Eunho Yang, Sung Ju Hwang, Jinwoo Shin *Aug. 2021*
- International Joint Conference on Artificial Intelligence (IJCAI), 2021
- NeurIPS Workshop for Machine Learning for Molecules, 2020

[C4] GTA: Graph Truncated Attention for Retrosynthesis *Online*
Seung-Woo Seo, You Young Song, June Yong Yang, Seohui Bae, Hankook Lee, Jinwoo Shin, Sung Ju Hwang, Eunho Yang *Feb. 2021*
- AAAI Conference on Artificial Intelligence (AAAI), 2021

[C3] Guiding Deep Molecular Optimization with Genetic Exploration *Online*
Sungsoo Ahn, Junsu Kim, Hankook Lee, Jinwoo Shin *Dec. 2020*
- Neural Information Processing Systems (NeurIPS), 2020

[C2] Self-supervised Label Augmentation via Input Transformations *Online*
Hankook Lee, Sung Ju Hwang, Jinwoo Shin *Jul. 2020*
- International Conference on Machine Learning (ICML), 2020
- Received Qualcomm-KAIST Innovation Awards (2019)

[C1] Learning What and Where to Transfer *Long Beach, CA, USA*
Yunhun Jang*, Hankook Lee*, Sung Ju Hwang, Jinwoo Shin *Jul. 2019*
- International Conference on Machine Learning (ICML), 2019

[P] Anytime Neural Prediction via Slicing Networks Vertically

Hankook Lee, Jinwoo Shin   *Jul. 2018*

- arXiv preprint

Work Experience

SAIT (Samsung Advanced Institute of Technology)   *Suwon, South Korea*
Visiting student   *Jan. 2020 - Mar. 2020*
- Developed ML-based retrosynthesis algorithms (AAAI 2021, IJCAI 2021 papers).

Frograms   *Seoul, South Korea*
Research and Development Engineer   *Aug. 2013 - Dec. 2014*
- Built an automatic movie tagging system using movies' news/reviews based on Latent Dirichlet Allocation (LDA).
- Built a Scala-based movie rating prediction system based on non-negative matrix factorization.
- The incorporation name was changed to Watcha Inc. at 2018.

Honors & Awards

2019	**Winner,** Qualcomm-KAIST Innovation Awards (ICML 2020 paper)	*Daejeon, South Korea*
2019	**Travel award,** International Conference on Machine Learning (ICML) 2019	*Long Beach, CA, USA*
2013	**Finalist,** International Collegiate Programming Contest (ICPC) World Finals	*St. Petersburg, Russia*
2012	**1st Place (Grand Prize),** International Collegiate Programming Contest (ICPC) Asia Daejeon Regional	*Daejeon, South Korea*
2010	**2nd Place (Gold Prize),** International Collegiate Programming Contest (ICPC) Asia Daejeon Regional	*Daejeon, South Korea*
2009	**Gold Prize,** Problem Solving Division, Korea Olympiad in Informatics (KOI)	*Seoul, South Korea*

Services

2022	**Conference Reviewer,** ICLR 2022
2021	**Conference Reviewer,** ICLR 2021, ICML 2021, NeurIPS 2021
2020	**Conference Reviewer,** ICLR 2020, NeruIPS 2020
2020	**Journal Reviewer,** ACM ToMPECS 2020
2018	**Journal Reviewer,** ACM ToMPECS 2018

Invited Talks

2021	**Self-supervised Label Augmentation via Input Transformations,** Samsung Electronics DIT Center	*Hwaseong, South Korea*
2020	**Learning What and Where to Transfer,** Samsung Electronics DIT Center	*Hwaseong, South Korea*
2019	**Learning What and Where to Transfer,** Summer Annual Conference of IEIE	*Jeju, South Korea*
2018	**Anytime Neural Prediction via Slicing Networks Vertically,** NAVER Labs	*Seongnam, South Korea*

Teaching Experience

2020	**TA: "Semantic Segmentation and Object Detection",** Samsung DS AI Expert Program (Instructor: Jinwoo Shin)	*Yongin, South Korea*
2019	**TA: "Optimization and Regulaization",** SK Hynix ML Program (Instructor: Jinwoo Shin)	*Daejeon, South Korea*
2019	**TA: "Transfer and Multi-task Learning",** Samsung DS AI Expert Program (Instructor: Jinwoo Shin)	*Daejeon, South Korea*
2018	**TA,** Seongnam-KAIST AI Program (Instructor: Jinwoo Shin)	*Seongnam, South Korea*
2018	**TA,** KB-KAIST AI Program (Instructor: Jinwoo Shin)	*Daejeon, South Korea*
2017	**TA,** KB-KAIST AI Program (Instructor: Jinwoo Shin)	*Seoul, South Korea*