Jaehyun Nam

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RESEARCH INTERESTS

My research primarily focuses on developing effective tabular learning frameworks for handling tabular prediction tasks such as classification and regression. In particular, I have focused on leveraging useful prior knowledge extracted from unlabeled tables to generate effective tasks for various algorithms such as meta-learning. More recently, I have been integrating large language models into the tabular learning framework using LLM's capabilities such as in-context learning and LLM as an optimization tool. I am also interested in AI for Science, such as molecular property prediction and molecule generation.

Keywords: Deep Tabular Learning, Large Language Model, AI for Science

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea

- Ph.D. in Artificial Intelligence — Sep 2023 – Present
  - Advisor: Prof. Jinwoo Shin
- M.S. in Artificial Intelligence — Mar 2022 – Aug 2023
  - Advisor: Prof. Jinwoo Shin

Seoul National University (SNU), Seoul, Republic of Korea

- B.S. in Industrial Engineering and Mathematical Sciences (minor) — Mar 2016 – Feb 2022
  - Advisor: Prof. Jaewook Lee

PUBLICATIONS

(*: Equal contribution)

PREPRINTS

[1] **Generating Novel Column Features for Tabular Learning via Decision Tree Reasoning of LLMs**
Jaehyun Nam, Seunghyuk Oh, Jihoon Tack, Jaehyung Kim, Jinwoo Shin
Under review, 2024

• Utilize an LLM as black-box optimizer to iteratively improve the rule that generates new column feature

• Propose the decision tree reasoning which can be interpreted to natural language, providing a learned effective knowledge of the entire dataset to the LLM

CONFERENCES

[3] **Data-Efficient Molecular Generation with Hierarchical Textual Inversion**
Seojin Kim, **Jaehyun Nam**, Sihyun Yu, Younghoon Shin, Jinwoo Shin
International Conference on Machine Learning (ICML), 2024
NeurIPS Workshop on New Frontiers of AI for Drug Discovery and Development (NeurIPSW-AI4D3), 2023

[2] **SuRe: Improving Open-domain Question Answering of LLMs via Summarized Retrieval**
Jaehyung Kim, **Jaehyun Nam**, Sangwoo Mo, Jongjin Park, Sang-Woo Lee, Minjoon Seo, Jung-Woo Ha, Jinwoo Shin
International Conference on Learning Representations (ICLR), 2024

[1] **STUNT: Few-shot Tabular Learning with Self-generated Tasks from Unlabeled Tables**
Jaehyun Nam, Jihoon Tack, Kyungmin Lee, Hankook Lee, Jinwoo Shin
International Conference on Learning Representations (ICLR), 2023, **Spotlight presentation (280/4956=5.6%)**
NeurIPS Workshop on Table Representation Learning (NeurIPSW-TRL), 2022
Bronze Prize, Samsung Humantech Paper Awards, 2023
Recipient, Google Conference Scholarships (APAC), 2023
Travel Award, International Conference on Learning Representations (ICLR), 2023
Grand Prize, KAIST-Samsung Electronics Industry-Academia Cooperation Paper Award, 2023

JOURNALS

[1] **Holistic Molecular Representation Learning via Multi-view Fragmentation**
Seojin Kim*, **Jaehyun Nam***, Junsu Kim, Hankook Lee, Sungsoo Ahn, Jinwoo Shin
Transactions on Machine Learning Research (TMLR), 2024
ICLR Workshop on Machine Learning for Materials (ICLRW-ML4Materials), 2023

WORKSHOPS

[1] **Semi-supervised Tabular Classification via In-context Learning of Large Language Models**
Jaehyun Nam, Woomin Song, Seong Hyeon Park, Jihoon Tack, Sukmin Yun, Jaehyung Kim, Jinwoo Shin
ICML Workshop on Efficient Systems for Foundation Models (ICMLW-ES-FoMo), 2023

INVITED TALKS

- **Semi-supervised Tabular Classification via In-context Learning of Large Language Models**
  Samsung Advanced Institue of Technology (Suwon, Korea) — Jun 2023
- **STUNT: Few-shot Tabular Learning with Self-generated Tasks from Unlabeled Tables**
  AI Expo Korea (Seoul, Korea) — May 2023
  International Conference on Learning Representations (Kigali, Rwanda) — May 2023
  Samsung Electronics Co., Ltd. (Virtual) — Mar 2023
  MOGAM Institue for Biomedical Research (Virtual) — Mar 2023
- **Privacy-preserving Median Selection and Secure Aggregation in Federated Learning**
  2021 Korean Mathematical Society Fall Meeting (Virtual) — Oct 2021
  Special Prize, National Cryptography Contest, 2021

WORK EXPERIENCES

- **SK Hynix** — Dec 2020 – Feb 2021
  Undergraduate Intern, Collaborate with Dr. Songho Baek's AI Solution team
- **Industrial & Mathematical Data Analytics Research Center (IMDARC)** — Sep 2020 – Dec 2020
  Undergraduate Intern, Collaborate with Prof. Woong Kook and Simplatform.Co.,Ltd

RESEARCH EXPERIENCES

- **CryptoLab**, Department of Mathematcial Sciences, SNU — Mar 2021 – Feb 2022
  Undergraduate Research Intern, Advised by Prof. Junghee Cheon
- **DSAIL**, Department of Industrial and Systems Engineering, KAIST — Dec 2020 – Jun 2021
  Undergraduate Research Intern, Advised by Prof. Chanyoung Park
- **SNUDM**, Department of Industrial Engineering, SNU — Jan 2020 – Feb 2020
  Undergraduate Research Intern, Advised by Prof. Sungzoon Cho

HONORS & AWARDS

- **Grand Prize ($5,000)**, KAIST-Samsung Electronics Industry-Academia Cooperation Paper Award — Aug 2023
- **Travel Award ($1,000)**, International Conference on Learning Representations (ICLR) — May 2023
- **Recipient ($3,000)**, Google Conference Scholarships (APAC) — May 2023
- **Bronze Prize ($5,000)**, Samsung Humantech Paper Awards — Feb 2023
- **Special Prize ($1,000)**, National Cryptography Context — Oct 2021
- **Recipient ($6,000)**, Hanseong Scholarship for Gifted Students — 2014–2016

ACADEMIC SERVICES

- **Workshop Reviewer** TRL@NeurIPS'23

TEACHING

- Peer Tutor, College Writing 2: Writing in Science & Technology, SNU — Fall 2020 – Fall 2021
- Peer Tutor, Caluculus 1, SNU — Spring 2020

LANGUAGES

- Korean: Native language.
- English: Fluent

SKILLS

- Python, PyTorch, LaTeX: Proficient
- R, Mosel, TensorFlow: Working Knowledge

[*CV compiled on 2024-05-03*]