Haoyu He

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EDUCATION

University of Tübingen, Tübingen, Germany *2022 - present*
PhD student in Machine Learning
Advisor: Prof. Andreas Geiger
Research Interest: We are pushing forward the development of (Transformer-based) models that don't assume flattened sequential inputs. We hypothesize that incorporating natural hierarchies (e.g., linguistic or image structures) can serve as inductive biases that improve model efficiency without sacrificing generalization because they are natural features.

Northeastern University, Boston, USA *2020 - 2022*
Msc in Artificial Intelligence
Advisors: Prof. Cheng Tan & Raman Chandrasekar
Research Experience: Worked on text simplification and neural network verification for systems, specifically.

Wuhan University of Science and Technology, Wuhan, China *2015 - 2019*
Bsc in Computer Science and Technology

WORK EXPERIENCE

Amazon AI Lab, Shanghai China *2020 - 2021*
Research Intern

- Introduced a meta-learning framework for knowledge distillation (KD) of Transformer-based language models. Unified existing KD objectives as instances of maximizing bounds of the mutual information (MI) and proposed a novel objective function to boost knowledge transfer based on MI estimation. Additionally, we designed the first automated KD algorithm *AutoDistiller* that automatically predict a good KD pipeline given a new dataset.

- Aforementioned work was accepted at SustaiNLP 2021, EMNLP workshop. Results in this paper are referenced by Stanford CS329p, 2021 fall.

Advisors: Dr. Xingjian Shi & Sheng Zha

SELECTED PUBLICATIONS

3. **NN4SysBench: Characterizing Neural Network Verification for Computer Systems**.
   Shuyi Lin, **Haoyu He**, Tianhao Wei, Kaidi Xu, Huan Zhang, Gagandeep Singh, Changliu Liu, Cheng Tan.
   *Neural Information Processing Systems (**NeurIPS**), 2024.*
   *Previously accepted by Workshop on Formal Verification of Machine Learning @ **ICML**, 2022.*

2. **HDT: Hierarchical Document Transformer.**
   Haoyu He, Markus Flicke, Jan Buchmann, Iryna Gurevych, Andreas Geiger.
   *Conference on Language Modeling (**COLM**), 2024.*

1. **Distiller: A Systematic Study of Model Distillation Methods in Natural Language Processing**.
   Haoyu He, Xingjian Shi, Jonas Mueller, Sheng Zha, Mu Li, George Karypis.
   *The Second Workshop on Simple and Efficient Natural Language Processing @ **EMNLP**, 2021.*

SOFTWARE

1. **Scholar Inbox**
   Markus Flicke, Vitalii Protsenko, Madhav Iyengar, **Haoyu He**, Jovan Cicvaric, Illia Shakun, Bora Kargi, Partha Ghosh, Lewin Scholz, Andreas Geiger.
   AVG, 2021 - present.
   A personal paper recommender which enables researchers to stay up-to-date with the most relevant progress in their field based on their personal research interests. We have supported ML conferences such as CVPR, ECCV, ICML, and ICLR with the conference planner feature to assist participants find relevant posters.
   Stats as of November 2024: 👥 >17,500.

SELECTED AWARDS AND HONORS

- Northeastern University, Khoury Research Scholarship *2021-2022*