Haoyu He
(He/Him/His)

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Date of Birth: 12 Feb 1997

Research Vision

My research interests lie within natural language processing and deep learning. Currently, I am broadly interested in the following topics: multimodal understanding, neural information retrieval, language models, few-shot learning in NLP, causal inference in NLP, and low-resource NLP.

Education

2020.6 – 2022.5 **Msc in Artificial Intelligence**, *Northeastern University*, Boston, USA.
GPA: 3.42/4.0
Courses: Foundations of Artificial Intelligence, Machine Learning, Programming Design Paradigm, Human Computer Interaction, Natural Language Processing

2015.9 – 2019.6 **BEng in Computer Science and Technology**, *Wuhan University of Science and Technology*, Wuhan, China.
GPA: 3.15/4.0
Core Courses:
Algorithm Design and Analysis(A+), Mathematical Modeling (A+), Basics of Numerical Calculation(A), Linear Algebra(A), Probability and Mathematical Statistics(A), Advanced Mathematics(A), Image Processing(A)

Research Experience

Title **Persuasive Robots for Health Behavior Change (In Progress)**

Supervisor *Prof. Dr. Timothy Bickmore*

Description In this project, we will explore how a humanoid robot (Pepper) can persuade people to make healthy choices. The robot will interact with people by three modalities: hand gesture, speech, and image on its display. I will mainly focus on building strong conversational ability for the robot and also the study on the effects of dialogue on human behavior change.

Title **Automatic Text Simplification (ATS) Using Advanced Deep Learning Techniques (In preparation to NAACL 2022)**

Supervisor *Prof. Dr. Raman Chandrasekar*

Description We proposed the first parametric metrics to directly measure the sentence-to-sentence cohesion and meaning preservation for ATS outputs resorting to pre-trained language models. The two metrics are all reference-free and correlate well to human evaluations. A simple showcase of this project can be found from this temporary link: http://afba-34-221-99-194.ngrok.io/ .

Industrial Experience

2020.12–2021.9 **Software Dev Engineer Intern**, *Amazon AI Lab*, Shanghai, China.
Worked as a research intern supervised by Dr. Xingjian Shi.
Detailed achievements:

- Devised a meta-learning framework to systematically study the underpinning factors within the process of KD. 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. Besides, we proposed the first automated KD algorithm *AutoDistiller* that can recommend a good KD pipeline for a new dataset.
- Aforementioned work was accepted at SustaiNLP 2021, EMNLP workshop. Results in this paper are referenced by the course Stanford CS329p, 2021 fall.
- Contributed to the open-source library GluonNLP.

2020.5–2020.8 **NLP Research Intern**, *E-Capital Transfer Co., Ltd.*, Shanghai, China.
Studied semantic language models and improved sentence similarity prediction in RASA-based conversational agents, a class of products in this company.
Achieved in improving the accuracy of sentence similarity prediction task from 34% to 52% on the business dataset.

2019.10–2020.4 **NLP Engineering Intern**, *Ipsos Consulting Co., Ltd.*, Shanghai, China.
Applied NLP and machine learning algorithms to develop models that are used to analyse surveys and marketing reports.

Publications

[1] Haoyu He, Xingjian Shi, Jonas Mueller, Sheng Zha, Mu Li, and George Karypis. Distiller: A systematic study of model distillation methods in natural language processing. In *Proceedings of the Second Workshop on Simple and Efficient Natural Language Processing*, pages 119–133, Virtual, November 2021. Association for Computational Linguistics.

Presentations

- Distiller: A Systematic Study of Model Distillation Methods in Natural Language Processing, SustaiNLP, EMNLP, 2021

Skills

- **Programming Languages** : Python, C/C++, Pytorch, Tensorflow.
- **Tools & Software**: Git, Linux, Ray Cluster, LaTeX.
- **English**: TOEFL: 102, GRE: 152+170+3.5.