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Haoyu He

Research Vision

My research interests lie within natural language processing with deep learning, including core NLP and interdisciplinary NLP research. Currently, I am broadly interested in the following topics: low-resource NLP, few-shot learning in NLP, multimodal understanding, language generation, and fact-checking. Besides, I am also open to other topics in NLP and deep learning.

Education

2020 – 2022 **Msc in Artificial Intelligence**, *Northeastern University*, Boston, USA.
GPA: 3.4/4.0
Courses: Foundations of Artificial Intelligence, Machine Learning, Programming Design Paradigm, Human Computer Interaction, Natural Language Processing

2015 – 2019 **BEng in Computer Science and Technology**, *Wuhan University of Science and Technology*, Wuhan, China.
GPA: 3.2/4.0
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. 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.

Title **Automatic Text Simplification (ATS) Using Advanced Deep Learning Techniques**

Supervisor *Prof. Raman Chandrasekar*

Description We proposed the first metrics to directly measure the sentence-to-sentence cohesion and meaning preservation for ATS outputs by taking advantage of pre-trained language models. We additionally provide a web app to visualize BERNICE and SAM results, you can find it here

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Industrial Experience

2020.12–2021.9 **Software Dev Engineer Intern**, *AWS AI Lab*, Shanghai, China.
Worked as a research intern supervised by Dr.Xingjian Shi, researched knowledge distillation (KD) in NLP.
Detailed achievements:

- Proposed a meta-learning framework that can be used to learn the underpinning factors within the process of KD. Based on this framework, we conducted a systematic experimental study of KD in NLP and proposed a novel objective function to boost knowledge transfer.
- Aforementioned work was accepted at SustaiNLP 2021, EMNLP workshop. And an improved version of this paper was submitted to AAAI 2022 (Waiting for final decision).
- Contributed to the open-source library GluonNLP.

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

2019.10–2020.3 **NLP Engineering Intern**, *Ipsos (China) Consulting Co., Ltd.*, Shanghai, China.
Used NLP techniques to develop models which are used to analyze 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.

Languages

- Chinese (Native), English (Fluent)

Skills

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