

# Haoyu He

(He/Him/His)

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Date of Birth: 12 Feb 1997

## Research Vision

My research vision is to build neural NLP methods that are confidently used for social good. To be specific, my research interests broadly lie within explainable NLP, commonsense reasoning, language models, and low-resource NLP.

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## 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)

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## Research Experience

- Title **Persuasive Robots for Health Behavior Change (In Progress)**  
Supervisor *Prof. Dr. Timothy Bickmore*  
Description In this project, we will explore how Pepper (a semi-humanoids robot manufactured by SoftBank) can persuade people to make healthy choices with vocal and nonverbal prompts. I will mainly explore how to empower the robot to understand then respond to conversations and how to integrate dialog with nonverbal cues to raise the persuasion performance.
- 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 coherence 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/> .

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## 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 SustainNLP 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 entity recognition and relation extraction models to build graph databases.

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## 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.

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## Presentations

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

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## Awards & Teaching Experience

- Khoury Research Apprenticeship Scholarship, Spring 2022
- Khoury Research Apprenticeship Scholarship, Fall 2021
- Teaching Assistant for CS 4120 Natural Language Processing, Spring 2022

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## Skills

- **Programming Languages** : Python, C/C++, Julia.
- **Tools & Software**: Git, Linux, Pytorch, Tensorflow, Ray Cluster, Neo4j, SQL, L<sup>A</sup>T<sub>E</sub>X.
- **English**: TOEFL: 102, GRE: 152+170+3.5.