

# Yixiao Song

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5<sup>th</sup>-year linguistics Ph.D and computer science master's student at UMass Amherst. Experienced in multilinguality, automatic and human evaluation of LLMs, machine translation evaluation, and grammar error correction.

## Education

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### Ph.D Student in Linguistics

(Advised by Prof. Mohit Iyyer & Prof. Rajesh Bhatt)

University of Massachusetts Amherst

3.94/4.0

2019-current

### M.S. in Computer Science

University of Massachusetts Amherst

2023-current

### M.A. in Germanic Linguistics

University of Konstanz

1.1/6.0 (excellent)

2016-2018

### B.A. in German

University of Shanghai for Science and Technology

3.71/4.0

2011-2015

## Publications

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### GEE! Grammar Error Explanation with Large Language Models

NAACL 2024 Findings

Yixiao Song, Kalpesh Krishna, Rajesh Bhatt, Kevin Gimpel, and Mohit Iyyer

- Proposed a two-step pipeline for generating grammar error explanation in natural language
- Utilized atomic edit extraction to guide the GEE generation to increase recall and precision
- Showed the high performance of the pipeline in German and Chinese GEE

### kNN-LM Does Not Improve Open-ended Text Generation

EMNLP 2023

Shufan Wang, Yixiao Song, Andrew Drozdov, Aparna Garimella, Varun Manjunatha, and Mohit Iyyer

- Revealed that interpolation-based retrieval-augmented LMs do not improve open-ended generation quality

### Paraphrasing evades detectors of AI-generated text, but retrieval is an effective defense

NeurIPS 2023

Kalpesh Krishna, Yixiao Song, Marzena Karpinska, John Wieting, and Mohit Iyyer

- Introduced a paraphrase generation model DIPPER which leverages context and offers diversity control
- Stress-tested and successfully evaded major AI-generated text detectors (e.g., watermarking, GPTZero)
- Proposed a simple but effective defense that relies on retrieving semantically-similar generations

### A Critical Evaluation of Evaluations for Long-form Question Answering

ACL 2023

Fangyuan Xu\*, Yixiao Song\*, Mohit Iyyer, and Eunsol Choi (\*Equal contribution)

- Comprehensively evaluated text generation metrics on long-form open-ended question answering generation
- First expert-annotated long-form question answering dataset

### SLING: Sino Linguistic Evaluation of Large Language Models

EMNLP 2022

Yixiao Song, Kalpesh Krishna, Rajesh Bhatt, and Mohit Iyyer

- A benchmark with 38K minimal sentence pairs in Mandarin Chinese
- Tested 18 publicly available pretrained monolingual and multi-lingual language models
- Showed that the average accuracy for LMs is far below human performance (69.7% vs. 97.1%)
- Revealed the strengths and weaknesses of large language models

### DEMETER: Diagnosing Evaluation Metrics for Translation

EMNLP 2022

Marzena Karpinska, Nishant Raj, Katherine Thai, Yixiao Song, Ankita Gupta, and Mohit Iyyer

- A diagnostic dataset with 31K English sentences (translated from 10 source languages)
- Evaluated the sensitivity of MT evaluation metrics to 35 different linguistic perturbations
- Found that learned metrics perform substantially better than string-based ones
- Revealed the strengths and weaknesses of learned metrics

## Internships

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### Quillbot, Learneo, Inc.

- Platform for grammar correction, translation and text rewriting  
Research Engineer Intern  
Improved German grammar error correction product  
(+5% copy rate & +1.7% 1-day retention compared to previous product)

June - September 2023

- **Cultural Institute of the Federal Republic of Germany (Goethe Institut)**  
Non-profit German cultural association, promoting the German language study abroad August 2014 - February 2016  
Translator, interpreter, project assistant
- **Friedrich Ebert Stiftung Shanghai Office**  
Non-profit German foundation funded by the Government of the Federal Republic of Germany April-July 2014  
Translator, project assistant

## Positions of Responsibility

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- **Reviewer** for NeurIPS 2023 R0-FoMo Workshop, EACL 2024 (Outstanding Reviewer), NAACL 2024, ACL 2024, BEA 2024, ESSLLI 2024
- **Instructor** of LING201 at UMass Amherst: How Language Works—Introduction to Linguistic Theory (R2)
- **Research Assistant** advised by Prof. Mohit Iyyer (Summer 2022): Human evaluation of model performance of long-form question answering.
- **Teaching Assistant** for courses at master level (University of Konstanz) and (under)graduate level (UMass Amherst)
- **Proceeding Editor** of NELS50 and SULA11
- **Student Research Assistant** in Deutsche Forschungsgemeinschaft Project—Questions at the Interfaces (P3 Alternative Questions)

## Works and Presentations

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### Mandarin Chinese Alternative Questions are not Disjoined Polar Questions

Yixiao Song 2021

- First qualification paper supervised by Prof. Rajesh Bhatt and Prof. Seth Cable

### Early Cue Effects of Chinese Relative Clause Comprehension in Pre-trained Language Model

Yixiao Song 2021

- Breadth Paper for satisfying Ph.D. requirements

### A Comparative Study of German and Chinese Alternative Questions

Yixiao Song 2018

- Poster presentation at Semantics and Philosophy in Europe
- Talk at the 17<sup>th</sup> China International Conference on Contemporary Linguistics

## Skills

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- **Natural Languages:** German, Shanghai Wu, Mandarin Chinese, English
- **Programming:** Python (PyTorch, Hugging Face), R, Linux, Perl
- **Others:** L<sup>A</sup>T<sub>E</sub>X, GitHub