

# Jiayu Shen

(She/Her)

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Computational Linguistics | NLP & Bias Analysis | Human-AI Collaboration

## Education

**Uppsala University, Sweden**

Aug. 2023 – Jun. 2025

*Digital Humanities*

Specialization: NLP, algorithmic bias, cognitive modeling, social implications of AI

**Key Courses:** Natural Language Processing, Language Technology Programming, Language Technology Mathematics, Distant Reading

**China University of Petroleum, Qingdao, China**

Sep. 2019 – Jun. 2023

*English Linguistics and Literature*

## Skills

**Programming**

Python

**NLP Tools & Libraries**

NLTK, spaCy, Gensim, Transformers, BERT, RoBERTa, GPT

**Machine Learning**

Neural Networks, TensorFlow, PyTorch

**Data Visualization**

Matplotlib, Seaborn

**Languages**

Mandarin (native), English (fluent), French (basic)

## Research Profile

Interdisciplinary researcher focused on how AI systems replicate and amplify societal bias. Integrating methods from NLP, cognitive science, and AI ethics, I analyze the structural and conceptual foundations of bias in large language models, with emphasis on interpretability and socio-technical mitigation strategies.

## Selected Research Projects

**Master Thesis: Uncovering Structural Bias in GPT-2**

Jan. 2025 – Jun. 2025

*Uppsala University, Supervisor: Matti La Mela*

- Investigates occupational-gender bias formation in GPT-2's semantic space using embedding projection, clustering, and cosine similarity.
- Integrates prototype theory and predictive processing to model how stereotypes are internalized.
- Evaluates representational harms through cognitive heuristics and sociotechnical critique.
- **Skills:** HuggingFace Transformers, embedding, clustering, unsupervised learning

**Internship: Topic Modeling of Nicholas of Cusa's Latin Sermons**

Sept. 2024

*Stockholm University, Prof. Beata Megyesi*

- Designed a hybrid LDA-transformer pipeline to extract latent theological themes.
- Explored historical linguistic patterns using multilingual embeddings.
- Contributed to bridging digital humanities with computational theology.

**Poe's Affective Topology: NLP Analysis of Literary Emotion**

Feb. 2024

*Uppsala University*

- Applied BERTopic and VADER to map emotional contours in Poe's works.
- Examined interpretability of sentiment outputs in relation to human affective perception.
- Connected NLP sentiment models to cognitive-linguistic theories of valence.

## **Endangered Language Modeling: Human-in-the-Loop Qiang NLP**

Jan. 2024

*Uppsala University*

- Led a digital preservation project for Qiang language using ASR and MT tools.
- Proposed interactive collaboration loop for community verification of outputs.
- Highlighted ethical and cultural implications in linguistic technology.

## **Undergraduate Thesis: Corpus Analysis of Lin Yutang's Translation Style**

Jun. 2023

*China University of Petroleum*

- Compared lexical patterns across Chinese and English editions using corpus tools.
- Applied computational stylistics to investigate translator agency.

## **Scholarship**

### **Cog-SUP Admission and SMART-UP Scholarship in Computational Linguistics**

Apr. 2025

Selected for full scholarship and research admission to the interdisciplinary M1 track at Université Paris Cité (Cogmaster), focused on the intersection of NLP, cognitive modeling, and algorithmic fairness.

### **Anders Wall Scholarship for Excellence in Interdisciplinary Studies**

Apr. 2024

Awarded by Uppsala University for outstanding academic performance and potential in AI ethics and cross-field research.

## **Referees**

### **Beáta Megyesi**

Professor of Computational Linguistics

Department of Linguistics, Stockholm University

`beata.megyesi@ling.su.se`

### **Matti La Mela**

Associate Professor (Docent) in Digital Humanities

Department of ALM, Uppsala University

`matti.lamela@abm.uu.se`