JIAYI ZHANG

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(Last Update 09/01/2024)

EDUCATION

Northeastern University   **Boston, MA**
Ph.D. Student, Computer Science   *Sep. 2024 –*
- **Supervisor:** Prof. Weiyan Shi
- **GPA:** 4.0

University of Michigan   **Ann Arbor, MI**
B.S. (Hons.) in Computer Science, Minor in Mathematics and Linguistics   *Sep. 2020 – Dec 2023*
- GPA: 3.89/4.0
- **Relevent Coursework:** Natural Language Processing, Information Retrieval, Deep Learning for CV, Machine Learning, Data Structures and Algorithms, Intro. to Computer Organization, Foundation of Computer Science, Probability Theory

University of Massachusetts at Amherst   **Amherst, MA**
B.S. in Computer Science   *Sep. 2019 – May 2020*
- GPA: 3.96/4.0

RESEARCH INTERESTS

My research interest lies in **building robust, reliable, and socially responsible Natural Language Processing (NLP) systems that align with human needs and preferences**.

RESEARCH EXPERIENCE

Simulating Realistic Dialogues with Persuasion and Resistance   **Boston, MA**
CHATS Lab | Mentor: Prof. Weiyan Shi   *Aug. 2024 – Present*
- Proposed principle simulation taxonomy and evaluation metric for dialogue simulation focusing on three aspects, linguistics naturalness, cognitive understanding, and interactive competence.
- Conducted experiments simulating social scenarios involving persuasion and resistance, such as donation, negotiation, and debate.
- Performed qualitative analysis to explore the relationship between various aspects of the proposed simulation taxonomy and the micro- and macro-level realism of dialogues.

Bipartisan Event Detection across Same-story Article based on Event Graph Reasoning   **Ann Arbor, MI**
LAUNCH Lab(UMICH) | Mentor: Prof. Lu Wang   *Jul. 2023 – Dec. 2024*
- Improved F1 scores on event and article level partisanship detection by constructing within- and cross-article event graphs for integration into heterogeneous Graph Neural Networks (GNNs).
- Interpreted the decision-making processes of GNNs to understand how the selection of partisan and counter-partisan events influence the overall partisanship of the article.

Analyzing the Role of Semantic Representations in the Era of Large Language Models   **Ann Arbor, MI**
LIT Lab(UMICH) | Mentor: Prof. Rada Mihalcea, Zhijing Jin   *May 2023 – Oct. 2023*
- Designed prompts for GPT-based models to produce Abstract Meaning Representation (AMR) on the LDC AMR 3.0 corpus, employing SMATCH-based scores for evaluation in an ablation study.
- Trained and fine-tuned BERT-based models to assess the helpfulness of including AMR as intermediate formal representations on various downstream tasks, such as paraphrase detection, machine translation, event extraction, and text-to-SQL generation.
- Applied Shapley value analysis to gauge and interpret feature importance in the AMR helpfulness classification.

Generative E2E Stance Detection with Knowledge Graph Augmentation   **Ann Arbor, MI**
LAUNCH Lab | Mentor: Prof. Lu Wang, Frederick Xinliang Zhang   *Sep 2021 – May 2022*
- Curated a new dataset with 10,619 annotations labeled at the sentence-level from news articles of different ideological leanings to support the study of entity-to-entity (E2E) stance detection.
- Performed data cleaning, and analyzed and fixed the error and corner cases for the entity linking task.
- Optimized annotation panel with React to coordinate the crowdsourcing data labeling and enhance annotation efficiency.

PUBLICATIONS & MANUSCRIPTS

Pre-print/In preparation

[P1] **Analyzing the Role of Semantic Representations in the Era of Large Language Models**
NAACL 2024
Zhijing Jin*, Yuen Chen*, Fernando Gonzalez, **Jiayi Zhang**, Jiarui Liu, Julian Michael[†], Bernhard Schölkopf[†], Mona Diab[†]

Thesis/Dissertation

[T1] **Towards More Reliable Natural Language Processing Systems**
Jiayi Zhang
Undergraduate Honor Thesis. 2023. University of Michigan.

* indicates equal contribution. † indicates equal supervision.

SELECTED COURSE PROJECTS

Unimodal Methods for DeepFake Audio and Video Classification with Spectral Features

EECS 545 - Machine Learning, Instructor: Prof. Honglak Lee, Michał Dereziński

- Adapted spectral-based deepfake image classifiers to the audio and video setting for the deepfake video detection task, achieving results similar to the more complex deep learning models with reduced model size and faster training time.
- Demonstrated the viability and effectiveness of spectral-based approaches for complex, multiclass deepfake video detection.

PLMs, Retrieval Augmentation and Diverse Decoding for ControllAble Dictionary Example Sentences Generation

EECS 595 - Natural Language Processing, Instructor: Prof. Joyce Chai

- Leveraged the quality and diversity of example sentences generated for dictionary entries with the proposed method of blending pretrained language model with retrieval-augmented generation and varied decoding techniques.

AWARDS & HONORS

- **University Honors** - University of Michigan — *2020 & 2021 & 2022 & 2023*
- **Dean's List Honors** - University of Massachusetts at Amherst — *2019 & 2020*
- **Chancellor's Scholarship** - University of Massachusetts at Amherst — *2019 & 2020*

TEACHING EXPERIENCE

Introduction to Computer Organization (EECS 370) — **Ann Arbor, MI**
Grader, University of Michigan — *Sep. 2021 – Dec. 2021*

Foundations of Computer Science (EECS 376) — **Ann Arbor, MI**
Grader, University of Michigan — *Jan. 2022 – Apr. 2022*

Probability Theory (MATH 525) — **Ann Arbor, MI**
Teaching Assistant, University of Michigan — *Sep. 2022 – Dec. 2022*

Intro to Natural Language Processing (EECS 487) — **Ann Arbor, MI**
Grader, University of Michigan — *Jan. 2023 – Present*

VOLUNTARY & SERVICES

- **Girls in Electrical Engineering and Computer Science** - *Peer Mentor* — *2022*
- **Engineering Research Symposium** - *Volunteer* — *2021*
- **Chinese Students and Scholars Association** - *Member of Publicity Department* — *2020*
- **Chinese National Olympiad in Informatics Provincial Round Training Camp**
  - *Voluntary Mentor* — *2018*

SKILLS

Programming Languages: Python, C++, C, MATLAB, Java, JavaScript, HTML/CSS, NodeJS, SQL
Framework/NLP: PyTorch, Tensorflow, Transformers, NLTK, SpaCy, Scikit-Learn, LangChain
Languages: Chinese (Native), English (Proficient, TOEFL 110 (R29 L30 S23 W28)), Classical Chinese