

# Bowen Yi

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## Research Interests

My research interests lie in **Human-Centered NLP**, **Behavioral Data Science**, and **Computational Social Science**. I focus on modeling social interactions and how **social roles** and **cultural differences** impact individual behavior in **multimodal data**, with applications in **mental health** and **education**. Moreover, I design methods that leverage **causal inference**, data science, and social science theories to derive actionable insights from large-scale behavioral data.

## Education

<b>Jan. 2023</b> <b>Present</b>	<b>University of Michigan - Ann Arbor</b> B.S. in <b>Computer Science</b>   GPA: 3.89/4.0 Coursework: Natural Language Processing, Human-Centered ML, Machine Learning, Computer Vision, Information Retrieval, Human-Centered Software Design and Development	<b>Ann Arbor, MI</b>
<b>Sep. 2021</b> <b>Dec. 2022</b>	<b>University of California - San Diego</b> B.S. in <b>Mathematics-Computer Science</b> , Minor in <b>Sociology</b>   GPA: 3.83/4.0 Coursework: Sociology of Health Care Issues, Introduction to Sociology, Statistics (in Psychology), Languages and Cultures, Linear Algebra, Calculus, Programming and Object-Oriented Design	<b>La Jolla, CA</b>

## Publications

S=In Submission, C=Conference, W=Working Paper

- [C.1] **The Generation Gap: Exploring Age Bias Underlying in the Value Systems of Large Language Models** [🔗]  
Siyang Liu and Trish Maturi and Bowen Yi and Siqi Shen and Rada Mihalcea  
*Conference on Empirical Methods in Natural Language Processing, Miami, USA* [EMNLP 2024]
- [S.3] **Examining Spanish Counseling with MIDAS: a Motivational Interviewing Dataset in Spanish** [🔗]  
Aylin Gunal, Bowen Yi, John Piette, Rada Mihalcea, Veronica Perez-Rosas  
[Under Review at NAACL 2025]
- [S.2] **Real or Robotic? Assessing Whether LLMs Accurately Simulate Qualities of Human Responses in Dialogue** [🔗]  
Jonathan Ivey\*, Shivani Kumar\*, Jiayu Liu\*, Hua Shen\*, Sushrita Rakshit\*, Rohan Raju\*, Haotian Zhang\*, Aparna Ananthasubramaniam\*, Junghwan Kim\*, Bowen Yi\*, Dustin Wright\*, Abraham Israeli\*, Anders Giovanni Møller\*, Lechen Zhang\*, David Jurgens (\* = Equal Contribution with Random Order)  
[Under Review at NAACL 2025]
- [S.1] **Causally Modeling the Linguistic and Social Factors that Predict Email Response** [🔗]  
Yinuo Xu\*, Sushrita Rakshit\*, Aparna Ananthasubramaniam\*, Omkar Yadav\*, Mingqian Zheng\*, Michael Jiang\*, Lechen Zhang\*, Bowen Yi\*, Kenan Alkiek\*, Abraham Israeli\*, Bangzhao Shu\*, Hua Shen\*, Jiaxin Pei\*, Haotian Zhang\*, Miriam Schirmer\*, David Jurgens (\* = Equal Contribution with Random Order)  
[Under Review at NAACL 2025]
- [W.1] **Uncovering the Impact of Intervention Messages on Diverse Population Groups**  
Bowen Yi, Rada Mihalcea, Fang Yu, Elena Frank, Joan Zhao, Srijan Sen, Maggie Makar

## Research Experience

### Behavioral Data Science

**Causal Effect of Intervention Messages on Medical Interns' Well-being** [S.4] Feb. 2024 - Present

Advisors: *Maggie Makar, Rada Mihalcea*

- Collaborate with **Srijan Sen's Lab** at Michigan Psychiatry to explore their 4-year data on intervention messages and 6,000+ medical interns' daily behavioral data, including mood, steps, and sleep.
- Estimate the heterogeneous treatment effects of different categories of intervention messages on various subgroups of patients, employing tools such as **EconML** and **scikit-learn**.
- Explore better language representations of intervention messages for valid causal inference, building on Lin et al.'s work on **isolated causal effect** and **sentecon**.
- Develop a subgroup-discovery method robust to data perturbations for identifying patient subgroups with significant treatment reactions, utilizing **DoubleML** and Random Forest.

## Human-Centered NLP

### Simulating Culturally-Aligned Mental Health Counseling

Sep. 2024 - Present

Advisor: [Rada Mihalcea](#)

- > Simulate counselor-patient conversations in mental health from Spanish culture using LLMs, based on **visual**, **speech**, and **text** information of the dataset in [S.3].
- > Align LLMs with doctor and patient behaviors in Spanish culture by exploring strategies such as prompt-based fine-tuning, fine-tuning, **reinforcement learning** (e.g. [DPO plus mechanistic understanding](#)), and **multi-agent frameworks**.
- > Develop a human-LLM collaborative **evaluation** framework to assess cultural sensitivity, behavioral alignment, and potential counseling quality of simulated personas, following criteria like [ENACT](#) while minimizing reliance on existing professional knowledge-based benchmarks.

### NLP for Enhanced Behavioral Counseling in Spanish [S.3]

Apr. 2024 - Nov. 2024

Advisors: [Verónica Pérez-Rosas](#), [Rada Mihalcea](#)

- > Collaborate with [John Piette](#) to introduce a new Spanish counseling dataset from 74 public videos, annotated by experts on counseling strategies. The dataset is used in ongoing work to simulate culturally aware doctor-patient interaction.
- > Analyzed culture-driven behavioral and psycholinguistic differences between the Spanish dataset and a parallel English dataset, such as the word-exchange ratio, language usage ([LIWC](#)), and sentiment.
- > Designed [P-Tuning experiments](#) on multilingual and monolingual LLMs to predict counselor behaviors such as reflections and questions.

### Assessing LLMs' Simulation of Human Responses in Dialogue [S.2]

July. 2024 - Sep. 2024

Advisors: [David Jurgens](#)

- > Evaluated **alignment** of LLM simulations with human interactions on 100,000 English, Chinese, and Russian dialogues from [the WildChat dataset](#)
- > Co-designed an **evaluation** framework and associated lexical/stylistic/semantic metrics to assess the alignment of simulated dialogues to real dialogues in multilingual settings.
- > Found a low alignment across all three languages among nine tested models, especially in lower-resource languages like Russian.

### Inspecting Age Bias in the Value Systems of LLMs [C.1]

April. 2024 - Jun. 2024

Advisors: [Rada Mihalcea](#)

- > Analyzed the alignment of social, economic, and other 11 categories of world values across six age groups in 62 countries on leading LLMs, leveraging data from the [World Values Survey](#).
- > Responsible for evaluating the age bias in [the Mistral model](#) and studying the impact of age identity prompts on value misalignment.
- > Findings suggested a general inclination of LLM values towards younger demographics, especially when tested on the US population.

## Computational Social Science

### Climate Change and Socio-Political Stability in Sub-Saharan Africa [C.2]

May. 2024 - Present

Advisor: [Verónica Pérez-Rosas](#)

- > Collaborate with social scientists from [Arun Agrawal's](#) lab to examine causal relationships between climate or demographic changes and sociopolitical stability as reflected in scientific literature.
- > Develop data infrastructure, analytical models, and an automated pipeline to collect and process over 20,000 relevant scientific articles, leveraging web scraping tools like Selenium and BeautifulSoup.

### Uncovering the Impact of George Floyd Incident on Podcast Ecosystem [Report, Dataset]

Aug. 2023 - Jun. 2024

Advisors: [David Jurgens](#), [Dallas Card](#)

- > Modeled the topical trends (using [Mallet](#)), [political bias](#), and conversation dynamics in 600,000+ transcribed podcast episodes published from May to June 2020.
- > Investigated the impact of George Floyd's death on podcast discussions across 79 themes, identifying named entities mentioned with George Floyd that reflect themes of social justice and police violence.
- > Fine-tuned and calibrated language models (e.g., RoBERTa, MiniLM) to classify news content and sentiment within podcast transcripts, with plans to incorporate **audio** features such as pitch into classifiers for better performance.

Modeling Conversational Dynamics in Email Exchanges [S.1]

Mar. 2023 - Jun. 2024

Advisor: David Jurgens

- > Analyzed 11.3M emails from the GMANE corpus, identifying and measuring key conversational dynamics and social-linguistic factors of email exchanges including intimacy, formality, and cogency.
- > Created a dataset of 1,800 emails annotated for intents, expectations, and 14 pragmatic features; benchmarked models including logistic regression and zero-shot LLMs.
- > Conducted causal analysis revealing that social status, argumentation quality, and social connection influence response rates, with social status being the most significant.

Industry Experience

Boardx.us

Jun. 2023 - Aug. 2023

Mentor: Mr. Feng Zhang

- > Contributed to designing collaborative/interactive digital whiteboards with a focus on improving user experience and managing company data on Microsoft Azure.
- > Assisted in integrating AI chatbots to inspire creativity in user design and writing.
- > Introduced accessibility features, including color-blind-friendly design, to make the product more inclusive.

Presentations

“NLP for Enhanced Behavioral Counseling in Spanish”

- > BoF session on Large Multimodal Models for Biomedical Research, EMNLP 2024 Nov. 2024 (Miami, FL)
- > Michigan AI Symposium, Embodied AI [Poster] Oct. 2024 (Ann Arbor, MI)
- > e-HAIL Symposium, Generative AI in Healthcare [Poster] Sep. 2024 (Ann Arbor, MI)

“Can LLMs Simulate Human Subject Studies?”

- > NLP Reading Group, Michigan AI Lab [Slides] | [Note] Sep. 2024 (Ann Arbor, MI)

“Podcast Study: Uncovering News in Non-News Space”

- > David Jurgens Lab Meeting, UMSI [Slides] Feb. 2024 (Ann Arbor, MI)

“Tutorial: Topic Modeling with Mallet”

- > David Jurgens Lab Meeting, UMSI [Slides] Nov. 2023 (Ann Arbor, MI)

Honours and Awards

University Honors, 2023 - 2024 | University of Michigan For achieving a GPA above 3.5 in every full-time term.

IEEE-Eta Kappa Nu, 2022 & 2024 | UC San Diego & University of Michigan Invited to membership for ranking in the top 25% of the junior class and top 33% of the senior class

Provost Honors, 2021 - 2022 | UC San Diego For achieving a GPA above 3.5 in every full-time term.

Teaching and Leadership

NLP Reading Group, University of Michigan Co-Organizer

Sep. 2024 - Present

- > Organize and host weekly paper presentations by designing event setups and providing speaker tutorials.
- > Communicate NLP research to attendees from non-CS fields (such as Medicine and Psychology) and undergraduates with limited experience, building an inclusive community of 180 active members.

Volunteer Tutor for College Applications

Oct. 2021 - Mar. 2023

- > Supported about 10 financially challenged international students from countries such as Mexico and Bangladesh through their first-year or transfer college applications.
- > Provided constructive feedback on essay brainstorming, standardized test preparation, major and college choice, etc.

Skills

DL/ML Programming	PyTorch, TensorFlow, PyTorch-Transformers, Scikit-Learn
Programming Languages	Python, C/C++, Java, HTML/CSS
Natural Languages	Hunanese (native), Mandarin (native), English (fluent), Cantonese (conversational), German (basic), Spanish (learning), Serbian (learning)