# Junsol Kim

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I am a Ph.D. student and a former machine learning engineer in the social media industry. My research focuses on understanding the societal impacts of AI and large language models (LLMs) on user behavior and improving digital platforms. I also design LLM-based solutions for scientific and industrial challenges. My research has been published in top journals and AI/data science conferences, including ***PNAS***, ***EMNLP***, and ***ICML***.

## WORKING PAPERS

**Junsol Kim**, Wang Z, Shi H, Ling HK, Evans J. Individual misinformation tagging reinforces echo chambers; Collective tagging does not. ***R&R (Minor Revision). Nature Communications.*** [Link]

- Using Twitter data and causal inference techniques, we estimate the effects of misinformation moderation (i.e., fact-checking) on user behavior. We find that fact-checked users reduce the diversity of information afterward, retreating to their information bubbles and reinforcing their "echo chamber".

**Junsol Kim**, Lee B. AI-Augmented Surveys: Leveraging Large Language Models and Surveys for Opinion Prediction. ***Under Review. Sociological Methods & Research.*** [Link]

- We develop the method of using LLMs to predict missing responses in survey data (i.e., missing data imputation). By fine-tuning LLMs to predict individual-level missing responses, our proposed method outperformed prior methods in predicting missing responses of survey participants.

**Junsol Kim**, Evans J, Schein A. Linear Representations of Political Perspective Emerge in Large Language Models. ***Under Review. ICLR 2025.***

- We utilize mechanistic interpretability tools to identify and control political biases of LLMs. Our study demonstrates that LLMs learn a linear "geometry of perspective" in their activation space, allowing them to represent and simulate ideological perspectives, such as liberal or conservative.

## SELECTED PUBLICATIONS (*equal contribution)

Potter Y, Lai S, Kim J, Evans J, Song D. Hidden Persuaders: How LLM Political Bias Could Sway Our Elections. ***EMNLP 2024 (Main).***

- Using randomized controlled experiments on 1,000 users, we evaluate whether LLMs have political leanings and are LLMs able to shift political views of human users interacting with them.

Lai S, Potter Y, Kim J, Zhuang R, Song D, Evans J. Evolving AI Collectives to Enhance Human Diversity and Enable Self-Regulation. ***ICML 2024 (Poster)***. [Link]

- We study how LLM agents evolve in a "society" of interacting agents and whether they can self-align prosocial behaviors. LLM agents in a small community spontaneously increased diversity and regulated toxic behaviors through social interactions without human intervention.

Hyon R, Youm Y, **Kim J**, Chey J, Kwak S, Parkinson C. Similarity in functional brain connectivity at rest predicts interpersonal closeness the social network of an entire village. ***PNAS.*** 2021. [Link]

- Using survey data, social network data, and neuroimaging data at the village level, we find that people with similar brain functions tend to be friends with each other.

- Youm Y*, **Kim J***, Kwak S, Chey J. Neural and social correlates of attitudinal brokerage: Using the complete social networks of two entire villages. ***Proceedings of the Royal Society B.*** 2021. [Link]

## EDUCATION

2021-2026 (Expected)
Ph.D. Sociology (Advisor: James Evans)
(With Certificate in Computational Social Science)
*University of Chicago*

2024
Visiting Graduate Fellow at the Institute for Pure and Applied Mathematics
*UCLA*

2013-2021
B.S. Computer Science & M.A. Sociology
*Yonsei University*

## WORK EXPERIENCES

2021 Machine Learning Engineer *Kakao Inc*.

## DATA SCIENCE AWARDS

eBay 2024 University Machine Learning Competition ***1st place*** (Public) [Link]

- I build LLMs that accurately predicts compatible vehicles for parts or accessories available on eBay, using part or accessory information as input text.

Kakao Melon Playlist Continuation Challenge ***2nd place*** [Link]

- I develop the machine learning-based model that recommend songs that are relevant to given music playlists.

## SKILLS

- Python, R, or SQL
- Natural Language Processing
- Causal Inference

## GRANT AND FELLOWSHIP

I have won $120,000+ from:

- University of Chicago
- UCLA
- Korea Ministry of Education
- Korea Ministry of Health and Welfare