Application for NBER Digital Economics and AI Tutorial

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1 Contact Information

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2 Academic Status

- Time of enrollment: Sept. 2023
- Years of enrollment: 2

2.1 Related Graduate Coursework

Below is a list of related graduate-level courses that I've taken at Northwestern. The department that offers each course is denoted in parentheses.

- Microeconomics (ECON)
- Econometrics (ECON)
- Information Economics (ECON)
- Industrial Organization (ECON)
- Innovation Economics (MEDS)
- Deep Learning (CS)
- Predictive Analysis (IEMS)

- Structural Modeling (Marketing)
- Causal Inference (Marketing)
- Bayesian Modeling (Marketing)

3 Research Information

3.1 Research Interest

Digital Market, Social Media, Human-AI Collaboration, Empirical IO

3.2 Research Projects in Progress

Politically Biased Moderation Drives Echo Chamber Formation: An Analysis of User-driven Content Removals on Reddit *with Jangwon Choi and Justin Huang*

Echo chambers – online spaces where individuals are met with reinforcing viewpoints and insulation from opposing viewpoints – are of increasing interest to social media platforms and policymakers amidst rising political polarization. Selective participation and algorithmic recommendations are commonly cited as drivers of echo chamber formation. In this work, we document a novel mechanism for the formation of echo chambers on social media sites: the politically biased content removal decisions of user moderators. Applying a combination of natural language processing and network analysis to characterize political leanings on a dataset of removed comments from 1.2 million users on Reddit, we document political bias in content removal: moderators are significantly more likely to remove content that differs from their political orientation. Further, using a matching approach, we show that content removals have an indirect chilling effect on censored users' subsequent political speech on the same channel. Finally, we conduct a counterfactual simulation and demonstrate that politically biased content removal increases echo chamber intensity. These findings are of broad interest to users, platforms and regulators who weigh the costs and benefits of freedom of expression with the logistics of moderating massive online spaces.

Optimal Signal Distortion for Biased Agents: A Structural Approach to Human-AI Collaboration

This project introduces "Behavioral Smart Predict-then-Optimize" (BSPO), a novel framework that integrates behavioral economics directly into the machine learning training loop to enhance human-AI collaboration. Diverging from standard "Predict-then-Optimize" approaches that assume

a rational downstream optimizer, and improving upon ex-post information design methods that rely on signal coarsening, BSPO endogenizes the human decision-maker's cognitive biases – such as conservatism or automation bias – into the AI's objective function. By structurally estimating a "human oracle" based on historical reaction functions and deriving a tractable convex surrogate loss, this framework allows AI models to learn an optimal continuous signal distortion policy. This endogenously calibrates predictions to the user's specific psychological profile, ensuring that the human's subjective posterior aligns with the rational decision boundary without the efficiency losses associated with discrete thresholding.