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National Bureau of Economic Research (NBER)

Digital Economics and AI Tutorial

Cambridge, MA

Description of Graduate Study and Enrollment I am a third-year PhD student in Quantitative Marketing at Cornell University, where I began my doctoral studies in August 2023. During my first two years at the Johnson School of Management, I completed the core microeconomics and econometrics sequences as well as coursework in applied game theory, structural models, and choice modeling. Since January 2025, I have continued my PhD at Cornell Tech, expanding my methodological training through courses in deep generative models, causal inference with machine learning, computer vision, natural language processing, and information networks. The combination of economics and computer science has shaped how I approach empirical work, particularly in settings characterized by unstructured high-dimensional data. Across my studies, I have been developing a research perspective that integrates ML methods with economic theory.

Research Interests and Current Projects My research agenda centers on what I call "PPP": polarization, personalization, and privacy. I combine economic theory with modern machine learning to develop measurement frameworks for high-dimensional data and to assess when additional information meaningfully improves decisions relative to its privacy cost. My current work advances this agenda through two core projects that treat PPP questions as problems of empirical measurement and information design in socio-technical systems.

My first-year paper, *Visual Polarization Measurement Using Counterfactual Image Generation,* accepted for presentation at the ACM Conference on Economics and Computation, develops a framework for isolating how news outlets visually portray political figures. Using generative models to produce counterfactual images of the same underlying event across different outlets, the paper holds the event fixed and varies only the editorial layer. This design moves beyond correlational approaches and provides a conceptually grounded measure of visual bias and polarization.

My second-year paper, *Geographical and Behavioral Information: Complements or Substitutes in Ad Personalization?,* studies the marginal value of different forms of user information in targeted advertising. Combining causal machine learning with large-scale behavioral data, the paper examines how the contribution of geographic information depends on the richness of users' behavioral histories. The results show that geography is most valuable when histories are sparse and adds little incremental benefit when histories are rich, making the underlying privacy–utility trade-off explicit and informing debates about responsible data collection in personalization systems.

I am also working on a broader effort to understand attention in long-form content such as podcasts and public talks. Using transcript-embedded engagement signals from platforms like YouTube, I am developing predictive models that capture how language, pacing, and topic structure shape moments of high or sustained attention. I also study how these mechanisms vary across genres and contexts, and how counterfactual edits to content could influence engagement without compromising the authenticity of a speaker's topic.

I would welcome the opportunity to attend the NBER Tutorial Meeting, as its focus on empirical measurement and information design closely complements the directions of my current research.

Sincerely,

Mohammad Mosaffa