D I S S E R T A T I O N P R O P O S A L

Jieqiong (Julie) Wang

“Essays on Marketing Research and Platform Economy”

Wednesday, December 4, 2024
10:00am
Tepper 5219

This dissertation explores the implications of consumer privacy and generative artificial intelligence on market competition, marketing research, and labor supply in the platform economy.

Chapter 1: Impact of Invisibles: Personalized Pricing on Platform with Anonymous Users

Customer segmentation and personalized pricing require a retailer to have access to high-quality data about its customers. However, as privacy regulations (e.g., GDPR and CCPA) grants consumers more control over their data, many of them choose not to be tracked by online retailers. The implications of limited consumer data on an e-commerce platform’s segmentation and personalized pricing strategies when it also competes with third-party sellers in a horizontally differentiated market are not well studied. Classical intuition suggests that personalized pricing intensifies competition in a horizontally differentiated market, leading to a less profitable equilibrium compared to when sellers do not have consumer information for personalized pricing. However, using a game-theoretical model, we show that the existence of anonymous customers could lead to imperfect customer segmentation—what we call “fuzzy segments”—which the platform owner could leverage to soften the competition and achieve higher-than-benchmark profits. Furthermore, such strategy also benefits third-party sellers. Welfare analysis indicates that consumer surplus is decreased.

Chapter 2: Using LLM to Elicit Consumer Preference with Confidence

With Large Language Models (LLMs) exhibiting features of text understanding and question answering, some marketing scholars are considering whether they have the potential to understand context and make choices as agents, as well as whether the LLM-made choices could provide insights into actual consumer preferences. The challenges of eliciting consumer preference using LLMs lie in (1) whether the preference elicited through LLM choices resembles the ground truth of human preferences, and (2) how someone can meaningfully incorporate LLM-elicited information without knowing the ground truth. The former question is usually done by evaluating the LLM outcomes against existing human-generated choice data sets (e.g., actual choices on insurance policies, survey responses to conjoint-type product choice questions, and intertemporal choices). However, this strategy is limited to scenarios where such ground truth is available. The latter question remains challenging but less studied. As a first step, we propose a measure for “model confidence with respect to a prompt” and test whether it correlates with how much information an LLM contains regarding the prompt. A future step is to investigate methods that involve a sequence of strategically designed queries to an LLM to iteratively get more informative answers to a question.

Chapter 3: The Impact of Generative Artificial Intelligence on the Labor Demand and Supply of Online Gig Workers

Generative artificial intelligence (AI) has exhibited strong capability to perform certain tasks, including text completion, translation, text-to-image generation, etc. Such capability has demonstrated potentials both to augment human labor by increasing productivity and/or to substitute human labor by automating the tasks completely. Therefore, its impact on the labor market is a non-trivial question to investigate.

While initial empirical evidence on the short-term implications documents a substitution effect of generative AI on the demand of online gig workers, the longer-term implications are important and not well studied. Leveraging data from a major online freelancer platform, including the gig worker profile, job post descriptions, and matching outcomes, we propose to study the implications of generative AI on the labor demand and supply of gig workers on the platform. By modeling the entry-exist decisions and skill-set transition of gig workers over time, we hope to better understand the shift in the market equilibrium and provide meaningful intervention tools for platform operation and user engagement.

Proposed Committee: Param Vir Singh (Co-Chair), Kannan Srinivasan (Co-Chair), Zoey Jiang, Minkyung Kim, Alan Montgomery, and Aniko Öry (outside reader)

Proposal Documents: https://cmu.box.com/s/wazcp2kyg3c9wnmor1wv6oq1600h85ao