Arslan Aziz

4th Year PhD Student in Information Systems
H. John Heinz III College
Carnegie Mellon University
Pittsburgh
Email: arslana@andrew.cmu.edu; Ph: 412 245 7254

EDUCATION

Heinz College, Carnegie Mellon University 2013 – 2018 (expected)
PhD Student in Information Systems

Indian Institute of Management, Kozhikode 2010
Master of Business Administration

Indian Institute of Technology, Madras 2008
Bachelor of Technology, Electrical Engineering

SELECTED HONORS & AWARDS

- ***Best Student Paper Award*, Workshop on Information Systems and Economics (WISE) 2015**, for the paper titled 'What is a Cookie Worth – Ad Effectiveness versus Consumer Privacy', joint work with Rahul Telang
- ***Suresh Konda Memorial Ph.D. Best First Research Paper Award***, Heinz College, Carnegie Mellon University, for the paper titled 'What is a Cookie Worth – Ad Effectiveness versus Consumer Privacy', joint work with Rahul Telang

RESEARCH

Peer-reviewed Conference Presentations

Arslan Aziz, Rahul Telang (2015) What is a Cookie Worth? ***NBER Summer Institute 2015, Economics of Digitization***

Arslan Aziz, Rahul Telang (2015) What is a Cookie Worth? – Ad Effectiveness versus Consumer Privacy, ***Conference on Information Systems and Technology (CIST)***, Philadelphia

Arslan Aziz, Rahul Telang (2015) What is a Cookie Worth? – Ad Effectiveness versus Consumer Privacy, ***The Economics of Information and Communication Technologies***, Paris

Arslan Aziz, Rahul Telang (2015) What is a Cookie Worth? – Ad Effectiveness versus Consumer Privacy, ***Workshop on Information Systems and Economics (WISE)***, Fort Worth, Texas

Arslan Aziz, Rahul Telang (2015) What is a Cookie Worth?, ***Sixth Annual Conference on Internet Search and Innovation***, Searle Center, Northwestern University

Working Paper - 1

Arslan Aziz, Rahul Telang, *What is a Cookie Worth? – Ad Effectiveness versus Consumer Privacy*

Abstract

Tracking a user's online browsing behavior to target her with relevant ads has become pervasive. There is an ongoing debate about the value of such tracking and the associated loss of privacy experienced by users. We inform this debate by quantifying the value of using different kinds of potentially privacy-intrusive information in targeted advertising. We collect a large proprietary dataset with over 1.3 million individual impression-bid-level observations. The data has detailed cookie information, as well as the bids placed by the firm for placing ads. We also know whether a user saw the ad and whether a purchased occurred. First we find that using more information from cookies increases the accuracy of prediction of purchases, but at a decreasing rate. We also find that firm's bidding decision (how much to bid for an ad) can be accurately predicted by cookie information. We then estimate the effect of an ad on users' purchase probability. In particular, we examine whether users who are targeted more aggressively by the firm are more likely to respond to ads. We find that on average, ads do not have a statistically significant effect on purchase probabilities. However, users who are classified as more likely buyers, do respond significantly more to the ads. To overcome potential endogeneity in ad placement, we use instrumental variables and find that these results are robust. Finally, we simulate different privacy policy regimes by restricting different kinds of user information from being used for targeted advertising and quantify the impact such restrictions have on sales. We find that using more privacy intrusive variables for targeting can increase ad effectiveness by about 85%.

Working Paper - 2

Arslan Aziz, Rahul Telang, *Third-party Tracking and Targeted Advertising*

Abstract

The number of online trackers on websites is growing rapidly and an increasing share of these trackers are third-party agencies. Most popular websites have dozens or even hundreds of third-party agencies tracking the behavior of their visitors. Consumers typically have little knowledge of the extent of tracking that is occurring, who is collecting their information and for what purpose. In this paper, we examine the role of third-party tracking in targeted advertising.

We model advertising competition between a symmetric duopoly of brands via a Second price auction. Assuming consumers have independent brand preferences, we model a consumer's decision to visit the websites of either brand based on their prior beliefs, solve for Bayes-Nash equilibrium bidding strategies for serving ads to the consumer by the two brands, and the resulting purchase decision of the consumer. We model advertising as having both an informative as well as persuasive effect. We compare the scenarios when brands have only first-party information versus when they have additional third-party information, and find that, under certain conditions, brand surplus from advertising can reduce with additional third-party information due to increased competition. Consumer surplus can increase from third-party information when consumers benefit from receiving ads from brands that were earlier not in their consideration set, and can decrease if their valuation for one brand is much higher than for the other brand.

Consumers can choose to block third-party tracking and we analyze the impact such a decision has on brand and consumer surplus. We show how blocking tracking can have an externality - positive or negative - by having an effect on the accuracy of targeting.

GRADUATE COURSEWORK

- PhD Microeconomics
- Statistical Theory for Social Sciences
- Math for Economists
- Analytical and Structural Models
- Bayesian Statistics
- Econometric Theory – I & II
- Game Theory & Applications
- Analytical Models in Marketing
- Advanced Data Analysis
- Estimating Structural Models
- Machine Learning
- Seminars in Information Systems – I, II & III

RESEARCH INTERESTS

Economics of Information Systems, Digital Advertising, Online Privacy, Empirical Industrial Organization, Mobile Internet, Sharing Economy, Crowdsourcing and Crowdfunding