

Studying the Privacy and Security Risks of XR Advertising

Research Statement for the VR4Sec2021 Workshop

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1 Research Statement

As extended reality (XR) devices become mainstream, so will XR advertising. XR advertising will offer numerous ways for businesses to interact with consumers. However, it also poses novel consumer risks, including possible privacy violations for consumers.

We know from online advertising that advertisers strive to collect vast quantities of user data to profile users and target ads – a trend likely to continue in XR. This presents novel risks given the extreme data collection capabilities of XR devices. XR devices can collect users’ physiological data, such as gaze direction, height, posture, as well as detailed information about a user’s environment (e.g., the layout of a room). As XR devices evolve and incorporate more sensors, the type of data and the scale at which it will be collected will increase substantially.

While XR privacy risks are not exclusive to advertising, advertising is a unique domain in several ways which change the way that privacy and privacy-preserving solutions must be approached. Advertising is a domain where data collection is legitimized: many justify data collection of advertisers on the basis that it helps target ads, reducing irrelevant ads for consumers. Moreover, in the US, the advertising industry is largely self-regulated through entities such as the Digital Advertising Alliance.

This suggests that the challenges and solutions for XR advertising privacy risks may be different than more general XR privacy and security risks. Legislation may not be effective given the self-governing model of the industry and the perceived legitimacy of data collection for advertising. There may be pushback from the XR device manufacturers to mitigate the privacy risks of XR if it interferes with advertising profit-generation. Educational interventions may have to be altered to question the legitimacy of data collection for the purposes of targeted advertising.

Given the privacy risks XR advertising poses, and the unique domain of advertising, it is imperative that the privacy and security research community investigates the privacy risks of XR advertising now, before practices become firmly entrenched. In my prior work published at CHI 2021¹, I investigated XR advertising in detail to examine what are scenarios for consumer harms, including privacy related harms. I look forward to participating in VR4Sec2021 to learn about other work studying XR privacy and security, and connections that can be made to XR advertising.

¹Abraham Hani Mhaidli and Florian Schaub. 2021. Identifying Manipulative Advertising Techniques in XR Through Scenario Construction. In CHI Conference on Human Factors in Computing Systems (CHI '21), May 8–13, 2021, Yokohama, Japan. ACM, New York, NY, USA 18 Pages. <https://doi.org/10.1145/3411764.3445253>