

Research Statement

“New Age Advertising: Harnessing Augmented Reality to Drive Interactivity and Long-Term Brand Engagement”

Introduction:

In today's world, where the average attention span is under 8 seconds, capturing and maintaining consumer attention is increasingly challenging. The proliferation of ad formats and their frequency poses a significant risk to the effectiveness of advertising strategies, potentially failing to satisfy marketers' objectives while leading to a declining user experience and creating ad fatigue. Research indicates that high ad frequency can negatively impact Return on Ad Spend (ROAS) and other advertising metrics. For example, Romero Leguina et al. (2021) found that excessive ad frequency leads to user irritation and reduced engagement, ultimately diminishing ROAS (Romero Leguina et al., 2021). Furthermore, studies show that high ad frequency contributes to ad fatigue, prompting many users to opt out of ads. Giombi et al. (2022) highlight that repeated exposure to the same advertisements increases consumer frustration, leading to actions such as using ad blockers or unsubscribing from services (Giombi et al., 2022).

Initially, single image ads were the traditional format, followed by the advent of carousel ads, and now short videos are causing significant disruption. Looking ahead, the platform is expected to evolve from digital to spatial. This research aims to revolutionize advertising practices by leveraging augmented reality (AR) as a cutting-edge tool that promotes interactivity, enhances user experiences, and fosters long-term brand loyalty. By exploring the relationship between AR, cognitive behavior, and neuroscience, this study seeks to develop innovative advertising strategies that not only engage consumers but also create lasting impacts on brand perception and loyalty.

Research Questions:

Given the novelty of this field and the vast array of research possibilities, formulating a specific research question is challenging. To encompass all relevant factors, I have developed several preliminary questions, which may evolve as the research progresses.

- *How can spatial computing and augmented reality (AR) advertising be designed to enhance consumer interaction and engagement, using principles from neuromarketing and cognitive behavior to optimize ad placement algorithms?*
- *How does the strategic placement of ads in spatial computing environments, informed by cognitive behavior and neuroscience, influence brand recall compared to traditional digital ad placements?*
- *How do interactive AR ads, optimized through neuromarketing techniques, affect consumers' perceptions of brand image, and how can Ad placement algorithms be fine-tuned to reinforce positive brand associations?*
- *In what ways can cognitive behavioral feedback loops be incorporated into AR advertising algorithms to enhance both immediate ad effectiveness and long-term brand engagement?*

These are a few preliminary research questions derived from the initial idea. Addressing all of them simultaneously is challenging, so refining and narrowing them down through brainstorming and design thinking will help make the research questions more specific. The four themes mentioned—Interaction and Engagement, Brand Recall and Cognitive Response, Enhancing Brand Image and Retention, and Behavioral Reactions and Ad Efficiency—each represent distinct areas of focus.

Literature Review and Context :

Existing literature underscores the significance of interactivity and engagement in contemporary advertising. Studies have shown that immersive technologies, such as AR, greatly enhance emotional engagement and memory retention (Tsai et al., n.d.). AR experiences promote deeper cognitive processing, resulting in higher brand recall and preference (Poushneh & Vasquez-Parraga, 2017). However, the intersection of AR, cognitive neuroscience, and advertising remains largely unexplored. This presents an opportunity to delve deeper and leverage these insights for the next generation of advertising innovations.

Neuroscience research indicates that interacting with AR can activate brain regions linked to motivation and reward, offering marketers a unique opportunity to create impactful advertisements (Fan et al., 2020). Additionally, previous studies suggest that personalized and contextually relevant ads can greatly enhance user experiences, leading to higher click-through rates (Chakraborty et al., 2019). My research aims to bridge the gap in understanding how AR advertising affects cognitive responses, laying the groundwork for developing advertising algorithms that boost both consumer engagement and long-term brand loyalty in spatial environments.

Methodology:

Traditional quantitative and qualitative analyses, whether thematic or chronological, are insufficient for this research, as it necessitates the integration of machine learning to potentially develop an ad algorithm for spatial environments. Collaborating with companies like Apple, Facebook, and Microsoft, which have heavily invested in AR technologies, will complement both their product testing and this research. Data from these tests will be employed in a mixed-methods approach, combining quantitative and qualitative techniques. Experiments will include utilizing neuroimaging (e.g., fMRI, EEG) to measure neural responses to various AR advertising formats, alongside recorded data from these devices. Additionally, user behavior will be analyzed through surveys and engagement metrics to understand cognitive processing in real-world contexts. This rigorous methodological framework will require significant effort and advanced technologies to integrate AI, spatial technologies, and marketing. Collaborating with tech companies for real-world experiments and a substantial sample size will enhance the research.

Impact and Contributions:

This research is well-suited for a PhD, as it focuses on long-term and next-generation marketing practices by integrating cognitive and neuromarketing techniques with machine learning Ad algorithms in spatial environments. This innovative approach has the potential to revolutionize marketing practices, creating a

lasting impact on brand association through highly interactive ad environments and visually aesthetic ad placements that align with eye coordination. This will provide brands and marketers with a new avenue for advertising their businesses. For consumers, this approach makes ads more engaging and reduces ad fatigue by delivering highly targeted and personalized ads that comply with GDPR and ethical advertising algorithms. This methodology can significantly benefit both users and marketers, transforming the landscape of marketing with this revolutionary approach.

References:

- Chakraborty, A., Ghosh, S., Ganguly, N., & Gummadi, K. P. (2019). Optimizing the recency-relevance-diversity trade-offs in non-personalized news recommendations. *Information Retrieval Journal*, 22(5), 447–475. <https://doi.org/10.1007/s10791-019-09351-2>
- Fan, X., Chai, Z., Deng, N., & Dong, X. (2020). Adoption of augmented reality in online retailing and consumers' product attitude: A cognitive perspective. *Journal of Retailing and Consumer Services*, 53, 101986. <https://doi.org/10.1016/j.jretconser.2019.101986>
- Giombi, K., Viator, C., Hoover, J., Tzeng, J., Sullivan, H. W., O'Donoghue, A. C., Southwell, B. G., & Kahwati, L. C. (2022). The impact of interactive advertising on consumer engagement, recall, and understanding: A scoping systematic review for informing regulatory science. *PLOS ONE*, 17(2), e0263339. <https://doi.org/10.1371/journal.pone.0263339>
- Poushneh, A., & Vasquez-Parraga, A. Z. (2017). Discernible impact of augmented reality on retail customer's experience, satisfaction and willingness to buy. *Journal of Retailing and Consumer Services*, 34, 229–234. <https://doi.org/10.1016/j.jretconser.2016.10.005>
- Romero Leguina, J., Cuevas Rumin, Á., & Cuevas Rumin, R. (2021). Optimizing the Frequency Capping: A Robust and Reliable Methodology to Define the Number of Ads to Maximize ROAS. *Applied Sciences*, 11(15), 6688. <https://doi.org/10.3390/app11156688>
- Tsai, Y., Huang, Y.-R., Zhang, J., & Young, F. (n.d.). Enhancing local identity learning and affective effectiveness through augmented reality. *Interactive Learning Environments*, 1–17. <https://doi.org/10.1080/10494820.2024.2350650>