



Bibliometric Analysis of the Intersection Between Sensory Marketing and Artificial Intelligence: Trends, Influential Contributors, and Future Directions

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Abstract

This study conducts a thorough examination of existing literature to explore the intersection of sensory marketing and artificial intelligence (AI), defining the overall research domain, identifying key themes, notable contributors, and developing trends. The study employs Biblioshiny from the Bibliometrix R package to examine publication trends, sources, authors, and citations. It accomplishes this by utilizing information from the Scopus database along with a specific search query featuring sensory and AI-focused keywords. Results reveal a substantial rise in research output since 2018, peaking in 2023, mainly in major journals like the Journal of the Acoustical Society of America and prominent authors, including Rui J and Wang J. The most referenced studies merge fundamental acoustics with innovative AI applications, with acoustics as the central focus. The research highlights AI's ability to improve multisensory consumer experiences while pinpointing shortcomings in non-auditory senses and ethical issues

Keywords

Sensory marketing, Artificial intelligence, Multisensory cues, Consumer engagement, AI personalization

1 Introduction

Consumer marketing strategies need to engage with elements other than just sight, touch, or hearing, the use of senses must be retained or integrated to modify perceptions, steer choices, or make the brand experience remarkable. More than forty years of research about marketing senses have had striking emphasis on progress. The frameworks have shifted from almost atmosphere-focused to the contemporary use of neuroscience, then to digital marketing, and extended to immersive devices like virtual reality and artificial intelligence [1,2]. Incorporation of sensory elements in marketing strategies have a direct correlation with customer satisfaction and retention, and continues to augment with artificial intelligence in marketing, providing the geared data and the sensory marketing systems to make tailored and targeted strategies almost automatically [2].

For more than just data analysis, the use of artificial intelligence has disrupted the marketing industry with novel ways of providing internal insight, forecasting, and customer personalization strategies, and it has certainly not gone unnoticed. The advancement of technological fields has been well documented, and in the volume of publications and other resources focusing on the marketing and educational use of the Internet of Medical Things, the growth of cross-discipline artificial intelligence application is well illustrated [3]. The integration of artificial intelligence with sensory marketing is an area of great promise, allowing more fluid, dynamic, and context-sensitive engagement with the consumer. Published research that intersects the domains of sensory marketing and AI is still lacking even though there is interest in each of those fields individually. This study aims to fill the gap in the literature by systematically mapping the overall research field, delineating central themes, major authors, and new developments in the intersecting fields. This research applies bibliometric methods to a custom dataset built across multiple repositories. With the dataset, the researcher analyzes the bibliometric data to formulate practical approaches for how sensory marketing and AI combined are changing consumer engagement in a hyperconnected, sensory-focused world.

This Bibliometric study aims to investigate the literature concerning sensory marketing and AI to identify their trends, contributors, and possible future research. Using different forms of bibliometric research, the study attempts to summarize the development and influence the domain has had within the literature. The aims are: Firstly, To Analyse Annual Scientific Production. To study the growth of research at the interface of sensory marketing and AI as represented in the published annual scientific works. This approach will illustrate the growth pattern, important research activity phases, and published work volume increase trends over time. Secondary, identify the most relevant sources. To find the most important journals, conference papers, or other publications relating to sensory marketing and AI, other publications contributing the discourse to sensory marketing and AI. This aim will reveal the major channels through which important research is published in the area, thus reflecting the academic division of the area. Thirdly, Apply Bradford's Law. To examine the spread of research articles published in journals using Bradford's Law, which argues that few journals of a specific discipline contain the bulk of the relevant articles. By addressing these objectives, the study aims to provide a robust foundation for understanding the current state of research, recognizing influential contributors, and identifying gaps and opportunities for future investigations in the dynamic and interdisciplinary field of sensory marketing and artificial intelligence.

2 Concept of sensory marketing

The strategic use of consumers' senses—sight, sound, touch, taste, and smell—to affect their attitudes, feelings, and actions toward a brand or product is known as sensory marketing. Marketers can improve brand recall, build emotional bonds, and influence consumer decisions by utilizing sensory stimuli to create immersive experiences [4]. With the incorporation of artificial intelligence (AI), which enhances the capacity to customize and maximize sensory experiences, this idea has drawn a lot of interest in marketing research. Utilizing the human sensory system, which interprets

environmental cues to influence consumer preferences, is the cornerstone of sensory marketing. Bright packaging or visually appealing ads are examples of visual stimuli that can boost brand appeal and elicit positive feelings [5]. For example, color psychology indicates

The core of sensory marketing is the use of the human sensory system, which deciphers environmental cues to affect consumer preferences. Examples of visual stimuli that can increase brand appeal and evoke positive emotions are eye-catching advertisements or bright packaging [5]. For instance, red is commonly used in food branding because color psychology indicates that it can stimulate appetite. Examples of auditory cues that influence mood and shopping behavior include jingles and background music in stores; studies show that slower tempos encourage longer store visits [6]. The core of sensory marketing is the use of the human sensory system, which deciphers environmental cues to affect consumer preferences. Examples of visual stimuli that can increase brand appeal and evoke positive emotions are eye-catching advertisements or bright packaging [5]. For instance, food branding often uses red because color psychology indicates that it can stimulate appetite. Auditory cues that influence mood and shopping behavior include jingles and ambient music in stores; studies show that slower tempos encourage longer store visits [6]. Artificial intelligence enhances sensory marketing by analyzing consumer data to personalize sensory experiences. Machine learning algorithms can predict preferences based on past behavior, giving brands the ability to quickly change visual ads, music playlists, or even fragrances [7]. For example, AI-powered solutions can use voice recognition to change auditory stimuli or adjust digital screens to match the demographics of a customer. Additionally, AI-powered virtual and augmented reality creates immersive multisensory environments by simulating product interactions before a purchase is made [8].

However, there are still problems like sensory overload and ethical quandaries when it comes to affecting customers' emotions. Overstimulation can lead to negative experiences, and AI's data-driven personalization raises privacy concerns [9]. According to studies, virtual reality (VR) and augmented reality (AR) are used to improve customers' sensory experiences in a virtual environment. Through improved visual representations and product experiences, AR and VR applications improve sensory perceptions and interactions [10]. Future research should look at how to balance sensory engagement with ethical marketing strategies, particularly as AI advances.

3 Methodology

This study employs a systematic bibliometric approach to analyze scholarly trends at the intersection of sensory marketing and artificial intelligence. The bibliometric approach ensures a rigorous and replicable selection of relevant literature, offering insights into the research field's growth, influential contributions, and thematic evolution. This study sourced academic publications from the Scopus database, a widely recognized repository of peer-reviewed literature. A structured search query was formulated using keywords related to both domains. The query included: ("sensory marketing" OR "experimental marketing" OR "sensory cues" OR "multisensory cues") AND ("artificial intelligence" OR "machine learning"). The initial search results

underwent a structured filtering process to ensure a targeted and relevant final dataset for analysis.

TITLE- ABS-KEY ("Sensory marketing" OR "Multisensory marketing" OR "Sensory cues" OR "Experiential marketing" OR "Smell" OR "Taste" OR "Touch" OR "Sight" AND "Artificial Intelligence" OR "Machine Learning" OR "Deep Learning" OR "AI")

Fig.1. Search term composition

For a systematic evaluation of research patterns, the curated dataset was analyzed using Biblioshiny, a specialized tool within the Bibliometrix R package. By leveraging Biblioshiny, this study systematically identifies key research trends, leading researchers (authors and sources), and thematic clusters. This process offers a comprehensive overview of the evolving literature on sensory marketing and artificial intelligence. The insights derived from this analysis contribute to understanding current knowledge gaps and potential directions for future research in this emerging field.

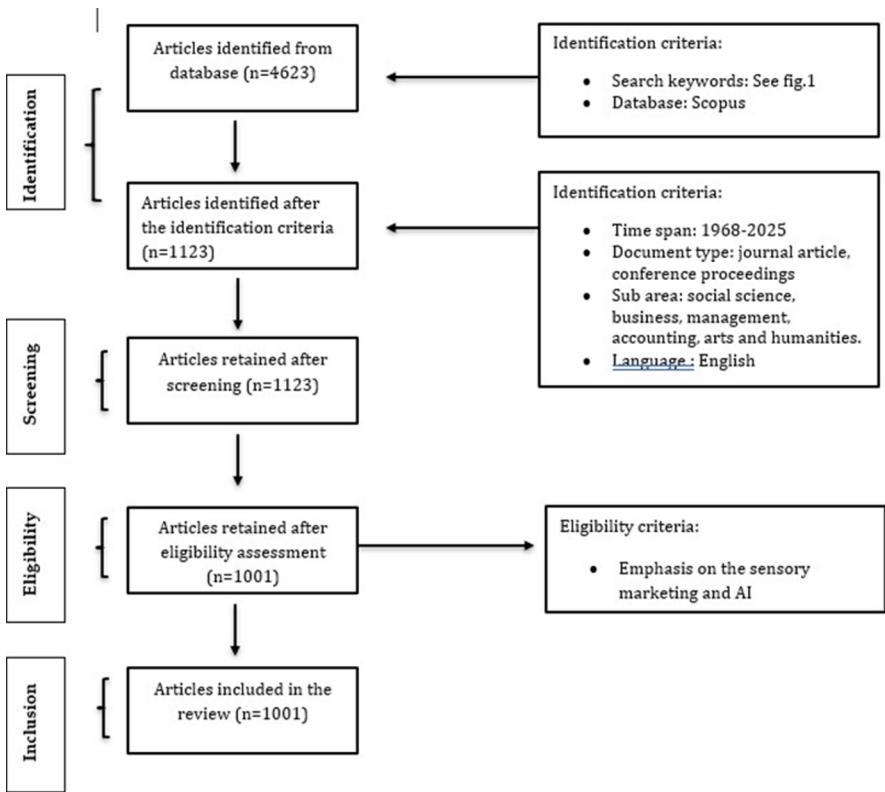


Fig.2. The steps of article collection and selection

4 Results and discussions

4.1. Annual Scientific Production

The graph illustrates the trend in yearly research publications, as measured by the number of published articles, from 1968 through 2025. For many years—specifically from 1968 to around 2010—the scientific output remained consistently low, with only a few articles released annually, indicating a prolonged period of minimal activity. A gradual increase began in the early 2000s, and a marked surge in publication can be observed starting roughly in 2015, accelerating sharply after 2018. The steep upward trajectory peaked in 2023 when the number of articles reached its highest level, indicating an era of intense research activity and possibly enhanced scientific collaboration or technological enablement. However, following this high, the graph reveals an abrupt decline in article production in subsequent years, dropping almost as quickly as it rose. This sudden downturn post-2023 may not accurately reflect a real reduction in scientific work; it could be due to incomplete data reporting for very recent

years, delayed record-keeping, or other administrative factors, which often result in lower counts for the latest years in such datasets.

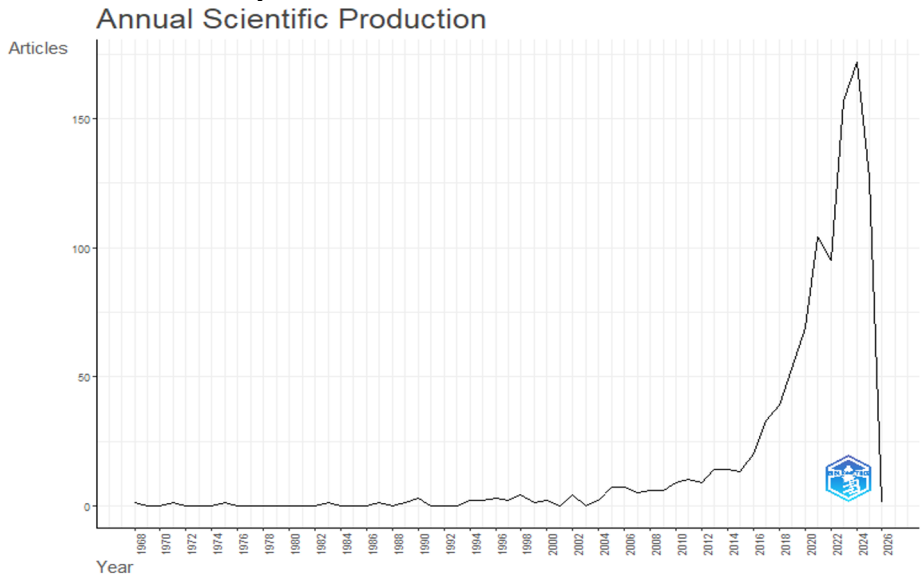


Fig.3. Annual Scientific Production

4.2. Most Relevant Sources

This chart visualizes the most prominent publication sources according to their number of relevant documents. The clear leader is the "Journal of the Acoustical Society of America," with 83 documents, making it the most influential and frequently cited source in this dataset. Following are the "Proceedings of the International Conference on New" and "Proceedings of the Annual Conference of the Intern," with 53 and 20 documents respectively, indicating these conferences also play significant roles in disseminating research within the field. The next group, including "Sustainability (Switzerland)," "International Computer Music Conference, ICMC Proc," "Artificial Intelligence," "AI and Society," "Artificial Intelligence Review," "Building and Environment," and "Knowledge-Based Systems," each contribute between 8 and 11 documents, reflecting their supportive yet secondary importance. These results suggest that research related to acoustics, artificial intelligence, sustainability, and computer music is diverse but especially concentrated within a few key journals and conference proceedings, with a strong emphasis on acoustical sciences and conference-based research dissemination.

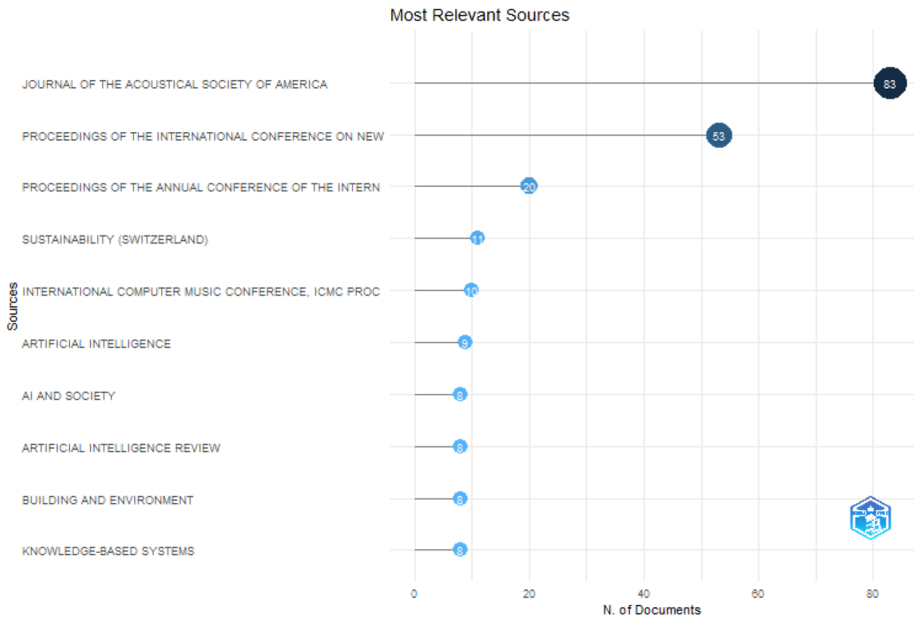


Fig.4. Most Relevant Sources

4.3. Bradford’s Law

This chart applies Bradford's Law to illustrate the distribution of articles among academic sources, identifying a small cluster of "core sources" where most articles are concentrated. The left side of the chart shows that the majority of articles are published in a few key journals and conference proceedings, such as the "Journal of the Acoustical Society of America" and related conference publications, indicated by the steep drop in the curve. As the source rank increases (moving right), the number of articles per source rapidly declines, demonstrating that the majority of sources—beyond the highlighted core—contribute only a handful of articles each. This visualization confirms Bradford's Law by highlighting how scientific productivity in this field is heavily concentrated among a select group of highly productive publications, while the remainder of sources have limited output and impact.

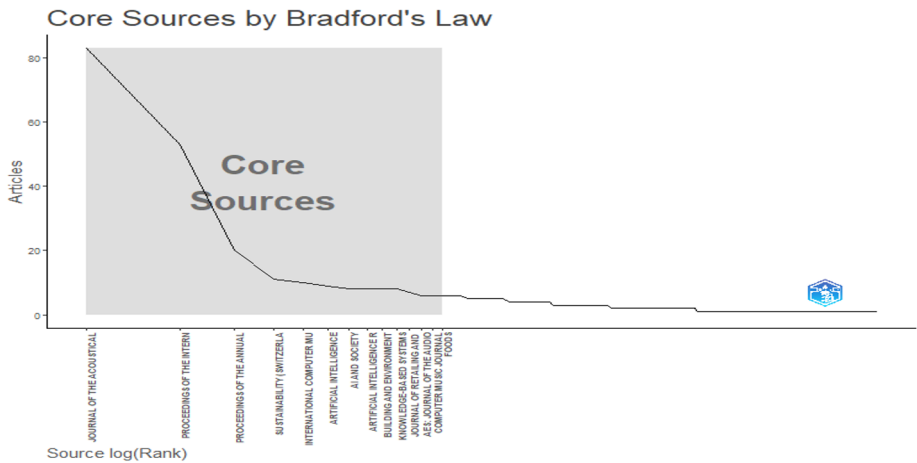


Fig.5. Bradford’s Law

4.4. Most Relevant Authors

The provided bubble chart, "Most Relevant Authors," visualizes the relevance of ten authors based on their number of documents and a corresponding relevance score. Authors Rui J and Wang J are highlighted as the most relevant, each with 10 documents and a relevance score of 8, represented by the largest, darkest bubbles. Following them is Keller JW, with 9 documents and a score of 7. The author Lis has 8 documents and a score of 6. The remaining six authors, including Liang T, Chen L, Feng M, Li S, Li Y, and He Q, are clustered together with 5 documents each and a relevance score of 4, indicated by the smallest, lightest bubbles. The chart effectively uses bubble size and color to visually represent the relevance score, making it easy to see which authors are the most impactful.

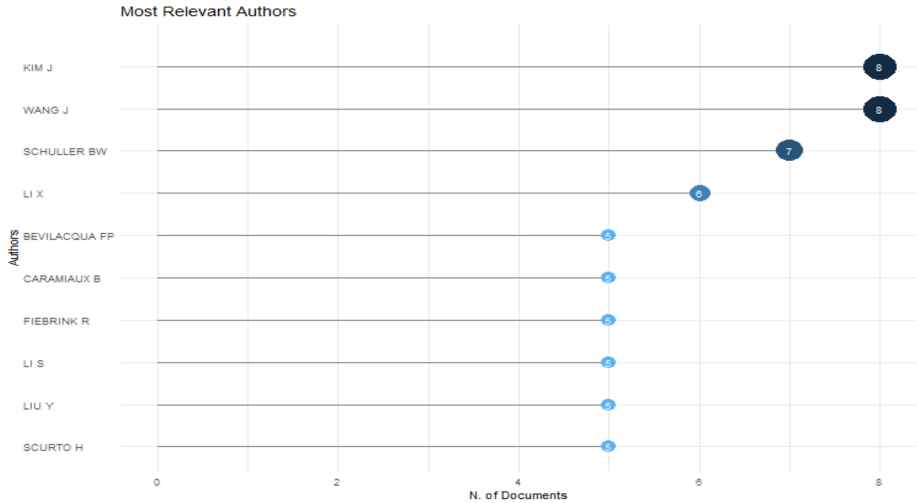


Fig.6. Most Relevant Authors

4.5. Most Globally Cited Documents

The Most Cited Documents chart is a bubble graph that visualizes the global citation count for ten different research papers. The documents are listed on the y-axis, and their citation numbers are plotted along the x-axis, with the exact count noted inside each bubble. The chart clearly shows that the document by PEREZ AIL (2008) is the most cited, with 747 citations, followed closely by the paper from LUO C (2009), which has 700 citations. Both are represented by the largest and darkest bubbles, highlighting their significant influence. The remaining documents show a descending order of citations, from BIAN BL (2013) with 476 citations down to LI W, WANG D (2008), which has the lowest count on the list with 200. This visual representation makes it easy to quickly identify the most impactful papers within the dataset.

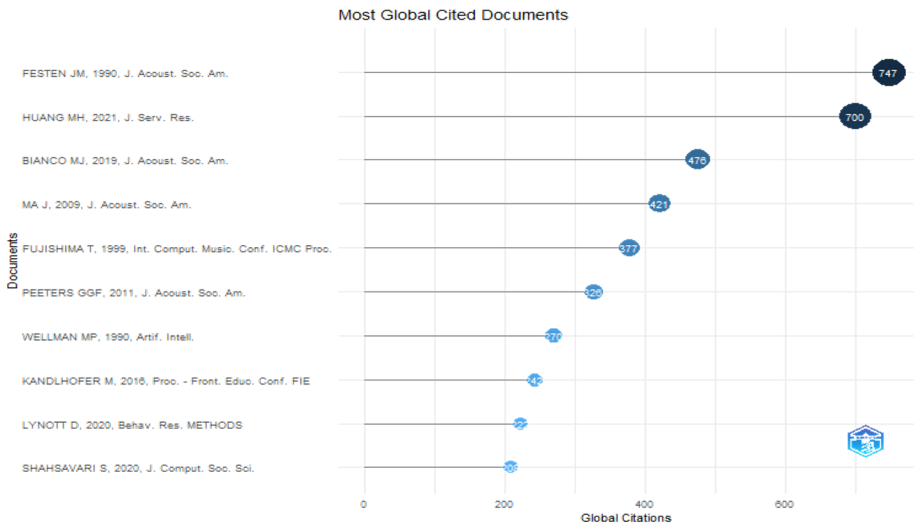


Fig.7. Most Globally Cited Documents

5 Findings and Suggestions

5.1. Findings

There has been a significant increase in interest from scholars in this area, particularly from 2018 onwards, with research activity reaching its highest levels in 2023. Research was scarce prior to 2010, but the recent rapid growth suggests that the topic is becoming increasingly important and timely. The significant decline after 2023 is probably a result of delays in data collection rather than an actual decline in interest. The majority of the research for this topic is produced by a small number of highly influential sources, which is a phenomenon explained by Bradford's Law. The Journal of the Acoustical Society of America is the most productive journal with 83 published documents, showing that research in acoustics is a core area of the discipline. Also, significant new research is communicated through conference proceedings. The research ecosystem has been structured by a small number of pivotal authors. The most significant authors, Kim J and Wang J, each produced 8 published documents. Their work is central to the development and direction of the field. The most globally cited documents highlight the intellectual cornerstones of the field. A 1990 paper by Festen JM is the most cited with 747 citations, underscoring the long-standing importance of

foundational acoustic science. A more recent highly cited paper by Huang MH (2021), with 700 citations, points to the contemporary relevance of AI applications in service research. This shows a blend of foundational science and modern application driving the discipline forward.

5.2. Suggestions

The results indicate a number of promising directions for further study to fill in the gaps and maintain the momentum. The data indicates that acoustics research is heavily concentrated. Future research should investigate how AI can be integrated with other senses in addition to sound. In marketing contexts, research could look into how AI can improve visual aesthetics (sight), produce customized scents (smell), produce haptic feedback (touch), and even affect taste perceptions. Improving customer experiences is regarded in marketing as a strategic efficiency capability that seeks to greatly enhance the way consumers engage with brands [11]. The creation and control of multisensory experiences by AI should be investigated in research. For instance, how can AI maximize customer engagement in a retail setting by coordinating visual and auditory cues? Research highlight how combining several AI-driven sensory inputs can have a synergistic effect. Hyper-personalized sensory marketing is made possible by AI, but this presents serious ethical issues. Future studies should look into the moral limits of utilizing AI to affect the feelings and actions of customers. Research could look into how customers feel about sensory personalization, privacy issues with data, and the possibility of deceptive tactics. Research on AI-driven sensory marketing in these novel contexts is necessary given the growth of virtual and augmented reality (VR/AR). Future research could look at how AI can overlay customized sensory data in the real world using augmented reality (AR) or create dynamic sensory feedback in virtual reality shopping experiences. Integrate artificial intelligence (AI) with neuro-monitoring tools such as electroencephalography (EEG) to develop marketing campaigns that instantly adjust to a customer's state of mind and emotions. Based on real-time neural feedback, an AI could dynamically change a store's lighting, music, and even ambient scent to boost engagement and lower stress. Create AI systems that can create distinctive "scent logos" for companies. In order to create a unique scent profile that could be utilized in physical stores, product packaging, and even digital advertising campaigns through smart diffusers, this AI could examine a brand's identity, target audience demographics, and desired emotional response. Examine how to replicate the feel of products online using cutting-edge haptic technology controlled by AI. For instance, on a consumer's smartphone or wearable gadget, an AI could convert fabric texture information (such as that of silk or wool) into particular vibration patterns that would enable them to "touch" clothing before buying them.

An AI could create a unique flavor profile for a brand or product based on its sales data, social media sentiment, or brand values. This could be used to create promotional food or beverage items that literally allow consumers to "taste the brand."

6 Conclusion

AI offers unique opportunities for the integration of digital senses. Using technologies like Extended Reality (XR), AI provides real-time immersive customer experiences with a convincing digital integration of sight, sound, and touch [11]. The convergence of sensory marketing and AI, as highlighted in the research, demonstrates the rapid progress this field has made in the past several years, in contrast to the sluggish start prior to 2010. The integrative advancements in AI and acoustics, as well as interdisciplinary confluences, have propelled the field. It is noteworthy that a disproportionate number of contributions have come from a limited pool of authors and sponsors, and the works have richly demonstrated the fusion of sensory marketing with data. While the field of research continues to acoustics, there is also research potential in the other senses, ethical-immersion, and the personalized-immersive gaps. Research in gaps such as haptic e-commerce, AI in cuisine, adaptive-neuro marketing, generative scent-scapes, and AI-assisted spatial transformations for immersive experiences will yield rewards to researchers willing to leverage AI. Overall, the potential in this field is groundbreaking.

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