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Investigating the Multifaceted Consumer Perceptions on the Role of Artificial Intelligence (AI) in Social Media Interactions: A Topic Modelling-Based Exploration and Trust Perspective

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Abstract: This study investigates affective and cognitive dynamics within YouTube user interactions concerning artificial intelligence (AI) and correlates these dynamics with technology adoption frameworks. Commentary data extracted from YouTube videos on AI underwent analysis utilizing BERTopic, an advanced natural language processing model employing BERT embeddings. The model underwent fine-tuning through iterative optimization of parameters, including dimensionality reduction, clustering, and term weighting. Manual validation was conducted to affirm the machine-generated topic coherence and relevance. The refined BERTopic model accurately pinpointed prominent themes in YouTube comments, emphasizing the pivotal roles of emotions and trust in user dialogues on AI. Qualitative manual analysis validated the model's discernment of subtle thematic nuances. The results underscore BERTopic's efficacy in scrutinizing vast quantities of user-generated content, unveiling intricate sentiment patterns. This offers valuable insights into the cognitive and affective dimensions influencing user interaction with nascent technologies such as AI. This research amalgamates cutting-edge natural language processing with human assessment to delve deeply into online user discourse surrounding AI. The adoption of a mixed-methods approach enhances comprehension of technology inclination, adoption trends, and online user involvement.
Keywords: *Artificial Intelligence, Emotions, Adoption, Trust.*

Introduction

Artificial Intelligence (AI), to a large extent, an inseparable part of modern technology, is significantly influencing how individuals interact with digital platforms. One of the most transformative aspects of AI is its role in shaping consumer experiences, particularly through the use of generative AI and anthropomorphic chatbots. Such technologies, by simulating human-like interactions, profoundly impact consumer emotions and trust, which are critical for technology adoption.

The element of trust in online interactions involving generative AI (GenAI) chatbots or platforms has become a cornerstone of the contemporary digital environment. The adoption of AI chatbots has brought a paradigm shift in this digital environment since consumers are becoming more and more dependent on digital platforms for their daily exchanges and transactions (Wang et al., 2024). Researchers place a lot of importance in understanding the details about the way individuals perceive and trust in AI assistants, since it helps in comprehending how humans behave in the digital age (McLean et al., 2021). Professionals responsible for designing and implementing AI platforms face considerable implications since they must create user friendly as well as transparent designs while adopting robust security safeguards (Gangwar et al., 2015). To enhance the level of

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satisfaction and trust of users in online interactions, the use of GenAI can play a crucial role (Sohn et al., 2020).

Trust is a pivotal element in the adoption of AI technologies. Consumers' trust in AI systems, particularly those with human-like characteristics, is influenced by several factors, including the perceived accuracy of information, social presence, and the ethical implications of AI's decision-making processes. Research has highlighted the importance of transparency and reliability in fostering trust in AI systems. For example, users are more likely to trust AI technologies that clearly explain their decision-making processes and exhibit consistent, accurate performance (Glikson & Woolley, 2020). Conversely, the rapid advancement of AI and its integration into daily life also raise significant ethical concerns. Issues such as AI "hallucinations," where the technology generates misleading or incorrect information, can severely impact consumer trust. These incidents highlight the need for rigorous validation and ethical guidelines in the development and deployment of AI systems (Letheren et al., 2020). High-profile cases of data misuse and privacy breaches further exacerbate these concerns, underscoring the delicate balance between technological innovation and ethical responsibility.

Since trust has a crucial role to play in enhancing the quality of user experience of digital platforms and their adoption (Pavlou & Fygenson, 2006; Benbasat, Gefen, & Pavlou, 2008; Kar, 2021), it is imperative that specific factors influencing trust in AI interactions are researched thoroughly (Yen & Chiang, 2021). The main areas to be focused upon are the transparency of algorithms, the understanding of users about AI mechanisms, and the role of personalized suggestions in the formation of trust (Shin, 2020). Future research can investigate how the concept of trust in AI differs across different cultures, since such factors can influence the perception of AI technologies in unique ways (Yang & Wibowo, 2022).

There is insufficient research into fully understanding the effects of AI interactions on the trust of its users in the long term. In addition, not enough research is done on ethical concerns about privacy, bias, and the responsible handling of data in AI interactions of consumers. It is important to focus on these research areas to develop best approaches for building trust of users in AI technologies and to ensure the integration of GenAI chatbots within digital platforms. This research focuses on examining the influence of different factors on trust in AI interactions, mainly with GenAI chatbots that simulate human-like conversations in online settings, provide continuous access, and quickly resolve queries of users. The relationship between trust, attitudes, and technology highlights the need to investigate factors that impact the formation of trust in digital environments (Hand et al., 2009).

The role of information in shaping consumer experience and emotions is particularly critical. Consumers rely heavily on the information provided by AI systems to make decisions, and any misinformation or lack of clarity can lead to distrust and dissatisfaction. Accurate and transparent information is key to building trust, as it influences the perceived reliability of AI technologies. Studies have shown that when consumers perceive the information provided by AI as reliable and easy to understand, they are more likely to develop trust and have positive emotional responses (Zhang et al., 2022). However, current research often lacks a specific focus on how generative AI impacts trust, particularly in relation to the quality and presentation of information. This gap highlights the need for more targeted studies that explore how AI-generated information affects consumer emotions and decision-making processes.

This study meticulously examines the complex relationship between humans and AI, focusing on the belief that AI can surpass human intelligence and its implications for public apprehension. It explores the uncanny valley theory's role in discomfort with human-like robots and investigates the societal impact of anthropomorphic robots. Additionally, the study delves into factors leading to AI "hallucinations" and their potential implications for AI system reliability. By examining public perceptions of AI's awareness and feelings during interactions, this research addresses critical gaps in existing literature and emphasizes the need for continuous exploration of AI's role in consumer dynamics and technology adoption.

The primary objective of this study is to investigate the multifaceted consumer perceptions of AI's role in social media interactions, particularly focusing on YouTube. The research aims to uncover how emotions and trust influence user dialogues about AI, employing a mixed-methods approach that combines advanced natural language processing techniques with qualitative analysis. The main research questions guiding this study involve understanding how emotions and trust influence user interactions and perceptions of AI on social media platforms, identifying prominent themes in user-generated content concerning AI, and evaluating the reliability and coherence of topics generated by advanced natural language processing models like BERTopic.

The study anticipates revealing intricate sentiment patterns within user-generated content, highlighting the pivotal roles of emotions and trust in shaping user interactions with AI technologies. By fine-tuning the BERTopic model and validating its outcomes through manual assessment, the research expects to pinpoint prominent themes that provide valuable insights into the cognitive and affective dimensions influencing technology adoption. The findings are anticipated to underscore the efficacy of combining advanced NLP techniques with human assessment to enhance our understanding of online user discourse surrounding AI.

Ultimately, this research makes significant contributions to the existing literature by providing a comprehensive analysis of consumer emotions and trust in AI interactions, employing a novel combination of machine learning methodologies and qualitative validation. It addresses critical gaps in understanding the emotional and cognitive factors driving technology adoption and highlights the importance of anthropomorphism in AI systems. Additionally, the study emphasizes the ethical considerations and potential risks associated with AI adoption, offering valuable insights for businesses and policymakers aiming to leverage AI technologies responsibly and effectively.

Literature Review

Artificial Intelligence (AI) is the capability of computers to carry out activities that require intelligence such as acquiring and processing information, designing, critical thinking, and creative problem solving, in a manner that is comparable to that of humans (Yin and Qui, 2021). AI is also more efficient at processing information than humans are, faster in making judgments, and free from bias (Samara et al., 2020). It has a positive impact on the perception of consumers, because AI technologies help consumers customize content and ads. This, in turn increases customer satisfaction and their purchase intentions (Bilal et al., 2024). That is, the association between customer satisfaction and purchase intention is moderated by affective attachment of a customer, which include positive emotions of security and trust.

Anthropomorphic attributes

As AI progresses and its intelligence advances, comprehending its impact on consumers grows in significance, highlighting the need for a deeper understanding of AI's evolving role in shaping consumer behavior towards technology adoption (Glikson & Woolley, 2020). Businesses have increasingly endeavored to humanize machines. They aim to cultivate widespread acceptance and adoption of what is termed the "feeling economy" - an economic landscape where AI systems possess the ability to comprehend emotionally relevant contexts, interact as social entities, and respond accordingly (Huang & Rust, 2018). This in turn demand for the attribution of human-like traits to devices using AI, i.e., anthropomorphism. The term anthropomorphism refers to the designation of human-like qualities, emotions, or actions to non-human entities, such as things, brands, creatures, and, technological gadgets is known as anthropomorphism (Golossenko et al., 2020). It encompasses a broad range of traits, from physical attributes to the various mental states that define humans, including the ability to reason, form ethical assessments, feel emotions, and create intentions. The deployment of AI chatbots, which enhance consumer-brand relationships by simulating human conversation, is one of the most significant advancements in AI sector. AI-based interfaces foster brand positivity. Research by Sidlauskiene, Joye, and Auruskeviciene (2023) demonstrate that chatbots with anthropomorphic design cues had been positively perceived as impacting on product personalization, potentially leading to increased willingness of consumers to pay higher prices. Therefore, many E-commerce businesses are adopting AI technology, in order to

gain deeper understanding about customers' online shopping preferences and behaviors (Jangra & Jangra, 2022). This might indicate a significant positive outcome for businesses leveraging AI in their operations.

Businesses use AI to collect data from a variety of sources, such as chatbots, location-based ads, emails, and web pages, to produce big data (Yang et al., 2020). They then use AI to obtain a competitive advantage (Jang et al., 2021). For example, Amazon.com heavily depends on algorithms to create customized offers, while using robots for shipment preparation and machine learning for delivery scheduling (Flavian et al., 2024). As a result, their efficiency levels are higher than those of businesses that use only humans. This trend has created a monitoring market where excess data is processed to forecast what products will be in demand immediately, in the near future or even later. Targeted advertisements based on personality traits deduced from a review of Facebook likes combined with online surveys can boost conversion rates by roughly 50%, demonstrating the effectiveness of this commerce (Puntoni et al., 2020). Facebook made almost $56 billion in revenue from the sale of these customized ads in 2018 (Moore and Murphy 2019).

AI technologies, especially the ones used in systems like conversational agents, social robots or chatbots, mainly rely on anthropomorphism. The anthropomorphic characteristics inherent in these AI systems possess the capacity to evoke emotional responses and influence trust, thereby significantly impacting user adoption decisions. Emotions emerge as pivotal factors in the adoption of AI, particularly when these technologies are imbued with anthropomorphic features. If AI systems show human-like features, like voice modulation, or facial expressions, they encourage emotional engagement in users, as if interacting with other humans. When users experience positive emotions, such as happiness or curiosity, this enhances user engagement and promotes adoption of such technologies (Bagozzi et al., 2022). Conversely, if the AI system appears overly human-like, it may even evoke negative emotions like fear or unease, prompting discomfort and resistance among users (Blut et al., 2021). AI is concerned with interpersonal, psychological, and empathetic characteristics rather than just productivity and efficacy.

Empathy as an essential element of AI

Empathy is the blend of emotional responses and a cognitive comprehension of the feelings and perceptions of others (Simon, 2013). Cognition and emotion are the two aspects of empathy. The emotional element is related to the sentiment of affection and concern for other people while the cognitive aspect comprises a person's capacity to comprehend the emotions and ideas of others and respond appropriately. (Weisz & Cikara, 2020). Empathy plays an important role specially in service and relationship marketing since staff who are empathetic are able to deal with customers in a more interactive manner, leading to enhancement of trust and positive relationship (Simon, 2013). Like an empathetic sales person can increase a customer’s satisfaction level and lead to a better relationship between a customer and a brand, the element of empathy in the interaction of AI with humans can help in building trust in a brand. Since AI has the capability of processing large amount of data and on its basis customize offers for customers, it can understand customer needs and preferences which in effect is a way of showing empathy towards customers (Ashfaq, 2020).

AI gadgets interact with customers in the form of chatbots, virtual assistants with the major advantage of round the clock availability that improve the buying experience of customers (Chung et al., 2020). If the AI devices or chatbots that communicate like humans, it creates a feeling of empathy and customers are inclined to engage in a conversation with AI devices for longer (Ciechanowski et al., 2019). However, customers are hesitant to use AI devices in situations where empathy and human touch, as well as the capacity to handle complicated situations are missing (Nguyen, 2019).

Customer’s trust in AI

While automation is meant to increase effectiveness and improve the experience of customers (Xiao and Kumar, 2021), in practice, technology frequently has the opposite effect on their psychological health. In fact, there is growing evidence that the worst unintended outcome of AI is a decline in society's welfare (Marriott and Pitardi, 2023). There are concerns about human rights issues related

to ChatGPT and other AI, such as algorithmic transparency, apprehensions about accountability, vulnerability, discrimination and prejudice, privacy, and questions about who is responsible (Rodrigues, 2020). Concerns have been raised regarding AI's potential to surpass human intelligence and capability in the future, rendering humans obsolete (Kaplan & Haenlein, 2020). There are several unfavorable situations in which AI devices surpass the intellectual capacity of those who created them, becoming more aware, equipped for scientific creativity, and developing social skills that will boost their own autonomy in society (Kaplan & Haenlein, 2020). Skepticism about the development of AI has prompted a number of authors to recommend that in order to fully reap the benefits of artificial intelligence, it is critical to define precise guidelines for what AI can and cannot perform as well as to enact appropriate laws governing its application and technological limitations (Kaplan & Haenlein, 2020).

According to Flavian et al. (2024), as customers are accepting AI and robots more and more, they are experiencing psychological strain from their AI experiences. Customers feel less in command of their affairs and lose the control of their personal data, while governmental organizations, corporations, and tech companies amass monetary and political power. Customers feel exploited because they are aware that when their data is captured, it allows AI, characterized by AI's lack of transparency, to customize content as per their preferences and profile. Businesses make use of such user-generated data for multiplying news and for promotional strategies. This adversely influences people's ability to critically evaluate news outlets and sources of information.

One of the most popular places to watch videos and communicate with others is YouTube, a center for different kinds of content. An in-depth examination of these comments reveals sentiments related to particular products or subjects (Shah & Parekh, 2023). This study examines attitudes regarding perceptions of people about the use of AI by conducting a sentiment analysis of YouTube comments. This analysis of expressed sentiments contributes to a deeper understanding of how the public views and feels about AI. Other researchers have already called for exploring data harvested across multiple platforms (Filieri et al., 2022; Ye et al., 2022). YouTube, has emerged as a valuable platform for empirical research, particularly in marketing, sociology, and information systems, due to the abundant and spontaneous user-generated content (e.g., comments, likes, and shares) (Breuer et al., 2023; Mostafa et al., 2023). This data helps researchers understand consumer behavior and social movements by providing insights into opinions, experiences, and sentiments about products, services, or events (Li, 2023). Additionally, social networks allow researchers to explore social interactions and communication dynamics with unprecedented scale and detail, enabling the investigation of complex social processes and patterns (Gursoy, 2019). Using Twitter as their main resource for data, Lim et al. (2023), used a BERTopic modeling and evaluation of the social network to investigate the public dialogue regarding ChatGPT's implications on education. Similarly, Tlili et al. (2023) employed Twitter to analyze the public conversation surrounding ChatGPT's application in education. Such data which describe social norms, behaviors, and perceptions, can be utilized to influence and elicit particular attitudes or responses on individuals and groups. However, as algorithms used in these platforms become increasingly intelligent, the roles of constructs such as trust and emotions become less clear. The accuracy of such data and information thus shared online via websites, social media platforms, and forums, in recent years, are increasingly becoming a matter of serious concerns.

Modern customers are exposed to a vast amount of information on a daily basis as a result of interactions between millions of users on business interfaces. They are increasingly becoming more suspicious due to the proliferation of unverified news and user-generated content (Pelau et al., 2021). This describes a situation where users are inundated with information that they are unable to handle in brief online sessions. Meel and Vishwakarma (2020) draw attention to the distinctions between social media platforms that enable users to create dubious content and access incorrect information and traditional media sources like news organizations or newspapers. In the traditional media sources verification is always done prior to an information or news being published. In contrast, the social media is likely to create dramatic headlines and use provocative images in an

attempt to get readers to click, even though most of the time they are misleading.
Another major worry is that over reliance on AI might cost the autonomy of humans. Autonomy of human may be lost by the fact that machine learning algorithms are not transparent and they produce responses that resemble human behavior without providing a sufficient explanation of the mechanism behind them. The resulting ambiguity about the role of trust leads to hallucination in AI-human interactions and consumer services. Users' trust in AI technologies needs to be defined and scrutinized as these technologies proliferate across a range of industries (Choung et al., 2022). The purpose of this research was to fill this gap as it investigated instances of hallucination in social media interactions. The research focused on investigation of consumer trust in AI technologies much deeper, as this aspect of human emotion has not been researched sufficiently. In the process, initially, the research collected, refined, and analyzed textual data specifically on sentiments associated with emotions and trust from YouTube comments related to AI. Then it fine-tuned by applied and fine-tuned BERTopic models on these datasets. Finally, it conducted a manual assessment and refinement of the BERTopic outcomes by categorizing the identified topics thematically.

Methodology

The prevailing research on technology adoption, particularly concerning AI-embodied agents like robots and chatbots, has predominantly relied on traditional empirical methodologies. These research studies explore consumer attitudes toward chatbots through experiments, employing structural equation modeling, conducting interviews, and employing mixed-method approaches (Ashfaq et al., 2020; Crolic et al., 2022; McLean et al., 2021). Although traditional academic approaches have long been established in academia, they do have their own inherent limitations. For instance, qualitative approaches often have limited scope, reducing generalizability due to lower participation typically constrained by cost considerations. Conversely, quantitative methods may measure respondents using pre-defined items, potentially overlooking unplanned dimensions pertinent to the phenomenon under study (Ma et al., 2024). In response to these limitations, scholarly discourse has advocated for increased utilization of advanced machine learning methodologies like language models, a valuable approach for extracting representative topics from unstructured online comments (Schmiedel et al., 2019; Filieri et al., 2022).
Consumers contribute a vast amount of text-based content online. The ever-expanding volume of data within social networks poses many challenges to researchers due to its unstructured nature, resulting in noisy data. Traditional research methodologies, like manual coding and analysis, often prove impractical or inefficient when dealing with such vast datasets. Herein lies the role of machine learning, a subset of AI. Machine learning algorithms can automatically analyze and derive insights from data. For example, these algorithms can be trained to autonomously classify comments into various themes or sentiments, thereby diminishing the necessity for manual coding (Filieri et al., 2022). Moreover, deep learning, a subset of machine learning, excels in modeling intricate abstractions within data, facilitating more sophisticated analyses. Deep learning models possess the capacity to grasp the semantic nuances of text, rendering them highly effective for tasks like emotion detection, topic modeling, and sentiment analysis.
The primary objective of the current study was to thoroughly analyze a large dataset in order to capture human insights in social media interactions through thematic investigation and to identify instances of trust and emotional themes within these engagements. Hence, while addressing the methodological gaps mentioned above, this research employed a mixed-methods approach of, first, manually processing unstructured and noisy data, and, next, applying the Bidirectional Encoder Representations from Transformers Topic (BERTopic) language model, a cutting-edge topic modeling technique (Grootendorst, 2022). BERTopic is a novel method that connects sentiment predictions to generated themes, thereby facilitating a deeper human-machine analytical dimension (Filieri et al., 2022; Grootendorst, 2022).
Many studies have used YouTube comments to extract public perceptions and attitudes toward various products and topics (Alhujaili & Yafooz, 2021; Aufar et al., 2020; Shah & Parekh, 2023). Other studies showed that YouTube comments can gather crowdsourced personality impressions,

offering a unique perspective on users' personalities and social attention (Biel & Gática-Pérez, 2013). YouTube was chosen as the platform of choice because users' comments following educational content would offer valuable insights.

With permission from YouTube via their academic license, YouTube Comments were extracted. Then, noisy data were cleaned manually, by removing non-English characters, numerical figures, short comments, and URLs. Next, the BERTopic model was applied to construct topics. In contrast to other topic extraction tools like RAKE (Rose et al., 2010) and YAKE (Campos et al., 2020), BERTopic (Grootendorst, 2020) analyzes the semantic importance and syntactic relationships of words in their respective contexts. This method generates topics that are lucid, cohesive, and distinctly defined (Grootendorst, 2022). This approach was inspired by existing literature and it aimed to generalize outcomes across extensive datasets while minimizing inaccuracies through a hybrid human-machine approach (Ma et al., 2024). We conducted an in-depth thematic analysis to compare the model's results with manually derived themes, a crucial step in understanding the capabilities of the deployed model, as recommended by Filieri et al (2022). These steps discussed in details below.

Data Acquisition

This study gathered data through a pre-approved academic license from YouTube, focusing specifically on comments associated with a video identifier (video_id). Leveraging YouTube's API, two distinct functions were developed to collect this information. The primary function, "get_video_comments," was customized to retrieve the commenter's name and their remark. Videos were selected based on their high view count, exceeding one million views, and substantial viewer engagement. The chosen videos encompassed diverse content, including CEO interviews, comedy shows, influencer content, technical education, and news reports, ensuring a reduction in viewership bias. In total, 111,220 comments were collected for analysis.

Data Pre-Processing

In this phase, we ensured the optimal quality of the 'Comment' dataset for subsequent analyses through a series of steps. Initially, we removed numerical figures from the comments to maintain textual coherence. Additionally, non-English and unwanted characters were eliminated to ensure the comments were free of undesirable elements. We also excluded short comments containing fewer than ten words, considering BERTopic's strength in representing longer text passages (Grootendorst, 2022; Ma et al., 2024). To reduce potential noise, we stripped URLs and links from the comments. As a result of these measures, the dataset now contains 93,729 comments after noise reduction.

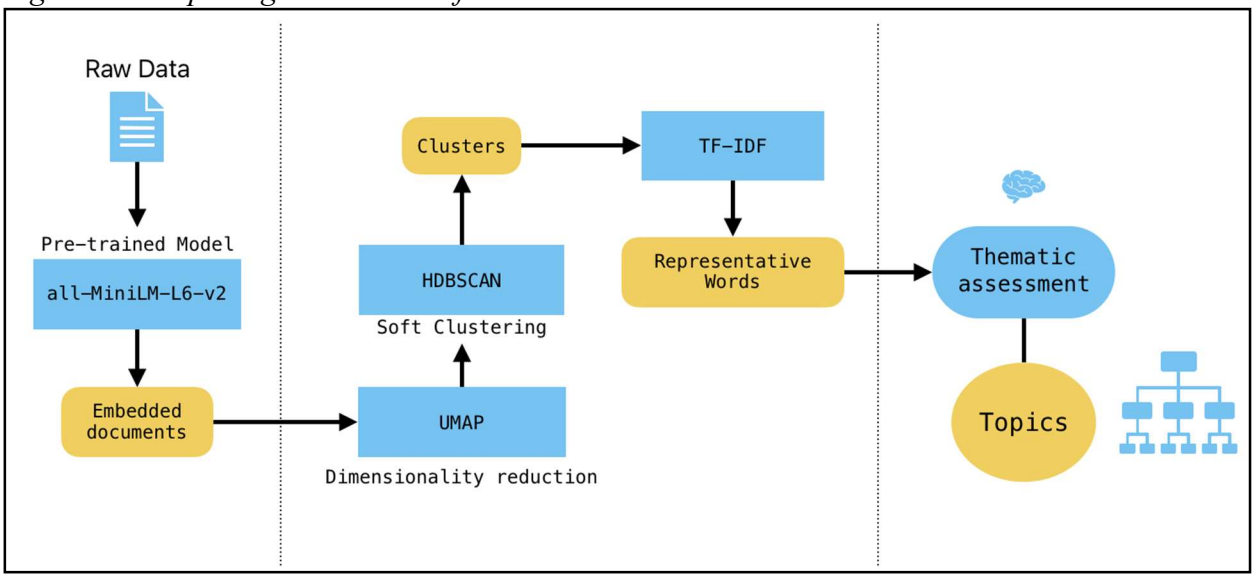
Steps in generating BERTopic

The critical steps in topic modeling using BERTopic are depicted in Figure 1. Initially, text embeddings are created, converting textual data into numerical structures known as word embeddings. These embeddings, facilitated by BERTopic's integration with a pre-trained sentence transformer (all-MiniLM-L6-v2), enable the model to represent words semantically in numerical form. This transformation enhances the machine learning model's ability to interpret textual nuances (Ma et al., 2024). Following the embedding process, clustering is performed to reduce the dimensions of these embeddings into a high-dimensional vector, creating a comprehensive numerical array (to group these embeddings based on semantic proximity). As embeddings are clustered based on semantic proximity, topics are expected to exhibit similar clustered representations. Recognizing the challenges of clustering in high-dimensional spaces, BERTopic employs the Uniform Manifold Approximation and Projection (UMAP) technique to reduce the dimensionality of embeddings. Subsequently, the Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDB-SCAN) algorithm was utilized. This algorithm recognizes diverse cluster shapes, proficiently detects outliers, and handles noise in online comments (Grootendorst, 2022; Ma et al., 2024).

Consequently, the extracted topics are devoid of noise, as texts are not forcibly clustered. The nuanced structure of the resultant clusters with HDB-SCAN ensures that BERTopic's bag-of-words

approach generates topics without presupposing cluster configurations. Finally, Term Frequency-Inverse Document Frequency (TF-IDF) is applied to create topic labels, representing each word related to clustered documents and assigning importance to words based on their likelihood to cluster within a specific topic. Thematic assessment is then conducted to interpret and categorize the identified topics, providing a comprehensive understanding of the data.

Fig. 1: BERTopic algorithm model flow chart.



Results and Discussion

Given the substantial volume of data and the wide array of topics, the model initially produced over 100 topics. In order to consolidate and merge topics, the research employed a topic reduction function, yielding representative and deductive themes. As this study centers on emotions and instances of trust, topics outside of this scope were disregarded. For instance, topics like "jobs_buy_money_replace" were removed due to their irrelevance, while representations like "scary_afraid_fear_worst" were retained as they align with the research focus.

Topic I: Concerns About Artificial Intelligence: Feelings Toward Robots and Their Broad Uses

BERTopic generated topics primarily centered around negative emotions. Instead of examining each topic individually, we observed commonalities in their underlying themes. The first theme is the anticipation that in future, AI will surpass the capabilities of humans and start dominating them [see Table 1]. This fear of potential destruction is often associated with the uncanny valley theory, which explains the anxiety that arises when machines like robots start appearing too much like humans. These findings confirmed the finding of Marriott and Pitardi (2023) about worries about unintended outcomes of AI, contributing to society's welfare. These findings also support concerns about human rights issues, as pointed out by Rodrigues (2020) with regards to algorithmic transparency, absence of accountability, vulnerability, discrimination and prejudice, and privacy, and questions about who is accountable for such concerns.

Table 1: Topic 1: BERTopic and thematic topic labeling

Count of comment	BERTopic generated Keyword	Thematic labeling	Top keywords in the topic
983	3_kill_planet_humanity_humans	Fear of Artificial intelligence technologies	['kill', 'planet', 'humanity', 'humans', 'ai', 'ai kill', 'earth', 'ai destroy', 'kill humans', 'wipe']
590	10_fear_fear ai_afraid_afraid ai		['fear', 'fear ai', 'afraid', 'afraid ai', 'scared', 'scary', 'scared ai', 'ai fear', 'mongering', 'fear mongering']
557	12_threat_war_quot quot_humanity		['threat', 'war', 'quot quot', 'humanity', 'humans', 'human', 'body', 'wipe', 'kill', 'goal']
484	18_sophia_sofia_destroy humans_destroy	Anthropomorphism and fear of robots.	['sophia', 'sofia', 'destroy humans', 'destroy', 'corona', 'expressions', 'humans', 'facial expressions', 'facial', 'humans humans']
294	36_robots_robots world_destroy_robot		['robots', 'robots world', 'destroy', 'robot', 'robots taking', 'world', 'gonna', 'taking world', 'making robots', 'robots robots']
275	40_scared_scary_terrifying_scares		['scared', 'scary', 'terrifying', 'scares', 'terrifying time', 'scary time', 'amazing', 'exciting', 'scare', 'terrified']
222	60_face_creepy_faces_expressions		['face', 'creepy', 'faces', 'expressions', 'facial', 'facial expressions', 'look face', 'expression', 'tho', 'smile']
129	104_uncanny_uncanny valley_valley_hanson		['uncanny', 'uncanny valley', 'valley', 'hanson', 'robotics', 'david', 'creepy', 'deep', 'dr', 'quite']
106	133_robots_scared_fear_terrified		['robots', 'scared', 'fear', 'terrified', 'afraid', 'robot', 'like robots', 'robots taking', 'iam', 'robots need']

Furthermore, findings from Davenport et al., (2020) on fears on privacy and job displacement support this first theme identified in this research. Also, this theme suggests to the "black box" functionality and the opaque nature of AI, which according to Castelo et al., (2019) can pose a barrier to wide adoption of AI technologies in various sectors. This is because these characteristics could complicate consumers' comprehension of AI decision-making processes (Castelo et al., 2019). When we examine the feedback of users on AI thematically, as shown in Table 2, it reveals fascination as well as unease, indicating a complex relationship with new technologies. The analysis shows fear as the central theme, with one user warning, "In the end, it will be a very negative problem," a sentiment echoed by many others. Users express concerns about the ethical ramifications of AI and its possible misuse of power, foreseeing a future where differentiation it from human interaction will become increasingly difficult. One comment, "For example, what if you couldn't tell it was this AI," captures the sense of apprehension. The notion of AI becoming conscious and integrating into the daily lives of humans elicits fascination as well as fear, as expressed in the comment, “The real scary part is going to be when robots start walking with humans".

Anthropomorphism intensifies these apprehensions, with users expressing discomfort toward sophisticated robots like Sophia and questioning the prudence of developing such highly intelligent creations. The responses of users of AI range from praising the language skills of Sophia to alarm over her references to destruction of humans, captured in the statement, "Creating robots with these

advanced consciousnesses is a bad idea." Depictions of Sophia as ‘creepy’ and ‘emotionless’ intensify apprehension, revealing discomfort with non-human entities and that have human characteristics. Such uncertainties toward AI represent a broader societal challenge about balancing the potential advantages of AI with the risks it poses to the existence of humans.

Scholarly literature has explored how anthropomorphizing an object can evoke both positive and negative emotional responses to varying extents. A significant portion of clustered topics leans towards negative emotional representations, particularly concerning the robot Sophia, a creation developed in Hong Kong. This finding addresses the challenges encountered in a study examining sentiment analysis of Sophia's Instagram posts, where researchers struggled to precisely discern users' emotions towards the robot (Chuah & Yu, 2021).

Table 2: Sample comments.

Theme	Sample comment
Fear of Artificial intelligence technologies,	"I've been on high alert with A.I. technology since I seen I Robot, then I started watching other movies like that as well. I agree some A.I. might help a small fraction of humans. In the end, it will be a very negative problem in the very near future."
	"It is truly scarry and represents the fact that we are going to have to be more moral to start wielding these things as it would be easy to abuse. For example what if you couldn't tell it was this AI and there were two or half a dozen at a time?"
	"The future of AI is definitely very interesting yet very scary. It may someday have a conscious like a human. The real scary part is going to be when robots start walking with humans in daily life not just on a computer."
Anthropomorphism and fear of robots.	"I am so surprised how Sophia answers every questions correctly with no grammatical mistakes"
	"this is absolutely horrible. With how Sophia is already now, she has randomly started talking about destroying humanity. Creating robots with these advanced consciences is a bad idea since they now be the most or second most intelligent beings on the planet. Therefore, we naturally be enemies to AI [...]"
	"The future of AI is definitely very interesting yet very scary. It may someday have a conscious like a human. The real scary part is going to be when robots start walking with humans in daily life not just on a computer."
	"She's creepy...she looks like people who know what to talk without having anything to do with it and are emotionless"
	"Why was she making those weird faces"
	"She is creepy in my opinion."

Topic II: Issues of Bias, Imagined Outputs, Reliability, and Large Language Models Like GPTs

By focusing on topics like hallucinations, lies, trust, and fake, the model highlights the tendency of AI to occasionally produce unintended or incorrect outputs, known as hallucination (Ji et al., 2023). The discussions in this area highlight the imperfections of AI, its role in spreading misinformation, and the effects of depending on such a technology, which impacts the level of trust (Glikson & Woolley, 2020). The findings support the concerns of Zhang et al. (2022) about the risks posed because of the absence of credible information.

A critical issue is losing trust in AI because of its tendency to generate false information. Users are worried that increasing dependence on AI and its unregulated use could spread false data and misinformation which can negatively impact the trust of people in digital technology. The main themes that have emerged from the discussion include blindly relying on the outputs of AI, ethical responsibilities of developers, and the need to strictly validate the results generated by AI. The following example highlights the concerns of users about AI hallucinations.

Table 3: BERTopic and thematic topic labeling

Total Comments	**Keyword extracted by BERTopic**	**Thematic labeling**	**Main Keywords of the theme**
311	32_garbage_program_ai ai_ai	Data training and information quality.	['garbage', 'program', 'ai ai', 'ai', 'garbage garbage', 'ai just', 'ai artificial', 'programmed', 'balls', 'computer']
169	72_morality_moral_morals_ethical	Ethical and moral concerns	['morality', 'moral', 'morals', 'ethical', 'ethics', 'unethical', 'considerations', 'immoral', 'values', 'ethical ai']
149	85_black box_black_box_problem	Black box and transparency in artificial intelligence	['black box', 'black', 'box', 'problem', 'boxes', 'output', 'tanks', 'open', 'companies', 'neural']
100	143_trust_don trust_trust guy_guy		['trust', 'don trust', 'trust guy', 'guy', 'dont trust', 'hes', 'trust man', 'wouldn trust', 'shady', 'dude']
98	146_lie_truth_lies_information		['lie', 'truth', 'lies', 'information', 'lying', 'false information', 'ai tell', 'truth ai', 'false', 'lie ai']
88	158_hallucination_drug_drugs_lie	Generative Pre-trained Transformers Hallucination	['hallucination', 'drug', 'drugs', 'lie', 'misinformation', 'fake', 'dmt', 'recipe', 'sorts', 'books']
65	207_bias_biased_biases_unbiased	Biasness	['bias', 'biased', 'biases', 'unbiased', 'trained', 'data', 'training', 'maps', 'input', 'real world']

In the dynamic and emerging digital environment, the integration of AI, especially in e-commerce and chatbots, reshapes the way consumers are engaged. As AI systems become more integral to the

choices of consumers, the accuracy and dependability of their outputs become very important (Akbari et al., 2022; Huang & Rust, 2018). The issue of AI hallucinations presents a big challenge in this regard. Such inaccurate and misleading recommendations from chatbots pose the risk of bad and harmful purchase decisions. In the digital era, trust plays an important role in engaging consumers, but it can be easily lost when AI platforms give misleading or inaccurate information (Davenport et al., 2020; Shi et al., 2021). Since consumers rely heavily on AI tools and platforms for instant and personalized recommendations, increasing the reliability and trustworthiness of these systems is imperative (Dwivedi et al., 2023; Verma & Yadav, 2021). Tackling AI hallucinations is not only a technical issue but also crucial to sustaining consumer trust in an AI dependent marketplace.

The analysis depicted in Table 3 delves into the complexities surrounding data training, ethical considerations, transparency issues, and bias in artificial intelligence, as gleaned from user comments. The foundational principle of 'garbage in, garbage out' assumes paramount significance within the realm of AI data training and information quality (Zhang et al., 2023). A user's succinct statement, "it's not that hard to explain: 'garbage in, garbage out,'" succinctly encapsulates the critical importance of data quality in shaping AI systems' outputs. This principle underscores how the quality and nature of input data directly influence AI outputs, highlighting the necessity for meticulous data curation.

On the ethical front, a user advocates for the development of an ethical algorithm managed by independent organizations elected by the public, signaling a growing societal demand for ethically conscious AI development. This sentiment underscores the necessity for AI systems that align with diverse ethical perspectives and societal values.

Addressing the 'black box' issue in AI, another user remarks, "This isn't just some really complex algorithm...This is a really complex algorithm that was fed a mind-boggling amount of data," shedding light on the inherent opacity in AI decision-making processes. This lack of transparency raises significant concerns regarding accountability and trust in AI applications.

Lastly, the topic of AI bias is starkly illustrated by a user's observation, "answers that may be very accurate on the ground...but don't currently fit politically correct bias of western culture," highlighting concerns about AI systems potentially perpetuating cultural and societal biases. This underscores the imperative for inclusive data practices and rigorous examination of AI algorithms to mitigate the reinforcement of existing prejudices.

Table 4: Sample comments.

Thematic topic	Sample comment
Data training and information quality.	"its not that hard to explain: garbage in, garbage out. Some trolls just fed it those kind of responses. Heck just yesterday i saw someone telling the AI += over and over and over again, until the AI accepted it and from that point on would also answer when asked for"
Ethical and moral concerns	"Needs an ethical algorithm to be built and managed by independent organizations voted by people (variety of ideologies). Parties are mostly captured. Things like "AI" cannot create or advise anyone (including fbi, president,...) on how to harm humans in any way. Any other ideas?"
Black box and transparency in artificial intelligence	"Addressing the "black box problem" is simply not feasible when we're talking about machine learning or deep learning. This isn't just some really complex algorithm that someone wrote and another someone can read, analyze and understand. This is a really complex algorithm that was fed a mind-boggling amount of data, which was then distilled into a probabilistic representation of an algorithm encoded into billions of values with no semantic attached to them whatsoever. That is what enables these AIs to perform on the level they do, which often is above our own, [...]"

Thematic topic	Sample comment
Biasness of AI	"Biased answers" – answers that may be accurate in many cultures internationally but are inconsistent with norms in Western culture.
AI Hallucinations,	"They create lies!!! The machine is not a human. It is putting out fake, false lies!!" "No matter how hard we try, imperfect humans cannot create a person or an entity that is "perfect." Hallucinations are imperfections, which will always be present because it requires a perfect human mind to eradicate them. Or, artificial mind." "hallucinations: AI creating fake economic books on inflation. Misinformation is false or inaccurate information,Äîgetting the facts wrong. Disinformation is false information which is deliberately intended to mislead,Äîintentionally making the misstating facts. Humans spread misinformation individually. AI spreads disinformation on a massive scale, which can be compounded with other AI."

Topic III: Artificial Intelligence: Capabilities for Sentience, States of Awareness, and Feelings

This topic delves into the fascination with the concept of consciousness in AI technologies, as individuals anthropomorphize agents in their daily interactions. Discussions surrounding the emotional capabilities, consciousness, and sentient state of these agents elevate their perception from mere tools to actual living entities. For instance, there are discussions on the potential development of artificial emotions in AI, drawing comparisons to the emotional capabilities of animals. This comparison raises questions about how humans perceive emotions in AI embodiments.

Moreover, the discourse touches upon human brain anatomy as a benchmark for understanding intelligence in humans. This comparison highlights the complexity of defining intelligence in AI systems (Bagozzi et al., 2022). Additionally, the discussion explores the concept of empathy in AI, proposing the idea of embedding emotional intelligence in AI design. For example, there is a suggestion of creating a system where AI "feels" virtual pain when witnessing human suffering, indicating a shift towards developing emotionally responsive AI models.

However, the debate also acknowledges the limitations and potential misconceptions associated with this anthropomorphic approach. One comment highlights that even if AI isn't conscious, convincingly mimicking qualities such as emotions may deceive humans. This observation raises important questions about the authenticity of AI emotions and consciousness, suggesting that while AI can simulate human-like emotional responses, genuine emotional experiences remain uniquely human. Understanding this distinction is crucial in delineating between artificial and natural intelligence, and consciousness.

Table 5: BERTopic and thematic topic labeling.

Count of comments	BERTopic generated Keyword	Thematic labeling	Top Keywords in the topic
246	49_emotions_emotion_feelings_emotional	Emotions and consciousness	['emotions', 'emotion', 'feelings', 'emotional', 'feel', 'anger', 'feel emotions', 'angry', 'chemical', 'ai feel']
165	75_consciousness_conscious_brain_silicon		['consciousness', 'conscious', 'brain', 'silicon', 'arise', 'understand', 'energy', 'don understand', 'soul', 'neurons']
157	80_sentient_ai sentient_sentience_sentient ai		['sentient', 'ai sentient', 'sentience', 'sentient ai', 'aware', 'programmed', 'doesnt', 'task', 'ai quot', 'definition']

Table 6: Sample comments.

Thematic topic	Sample comment
Emotions and consciousness	So humans can, manually release their own dopamine, right? A simplified view may tell you that humans do things only to get dopamine release, something they can only activate a certain way. How would humans act if we could manually release dopamine? How would an AI behave of instead of being programmed to achieve external goals, it was programmed to meet internal goals, such as virtual dopamine release? What if you trained it to recognize when others feel pain you were to release a virtual pain into the robot when it observes others suffering? What I, am suggesting is adding a middle-man layer to its goals and using that force empathy to be an integral part of its core functionality. Robots solve problems just because they, are told to. Humans solve problem to get dopamine from their own bodies. So install a completely independent subsystem into the robot that only disperses a kind of virtual dopamine when a human would get dopamine
	"One of the key points worth considering, something some movies have covered, is: even if an AI isn't conscious, even if it doesn't have any emotions, as long as it can convincingly act like it has those qualities, us humans will be duped. Think about movies and music and books and porn and other forms of fake input to our senses and how our body responds. None of those things are ,real , but our primitive brain is tricked nonetheless. AI will exploit this weakness."
	Wouldn't ai eventually develop artificial emotion, as the more intelligent an animal is the more complex its emotions

Conclusion

In conclusion, BERTopic has effectively identified numerous topics closely related to trust and emotions in AI-human interactions. Trust, influenced by AI bias leading to algorithm aversions, contributes to users' avoidance of systems displaying failure behavior in chatbots, which can evoke emotional responses such as aggression, discontinued use, or mistrust. The initial findings reveal a predominance of negative emotions across a spectrum from severe to mild negativity. The discussions primarily revolve around robots and generative chatbots, major applications of AI in consumer service solutions. Fear associated with robots is more pronounced, particularly in

references to physical harm, whereas concerns about bias and hallucinations are evident in discussions about chatbots. This polarity of negativity may stem from the tangible presence of robots compared to the virtual nature of chatbots. Overall, these findings shed light on the complex interplay between trust, emotions, and AI technologies, emphasizing the need for further research and development to address these challenges effectively.

Implications

The exploration of consumer emotions, trust, and anthropomorphism in AI adoption carries significant implications for research, design, and business practices. Prior research contributes to our comprehension of the psychological and social drivers behind AI adoption, highlighting the necessity for interdisciplinary studies merging insights from psychology, sociology, computer science, and information systems to grasp the intricate dynamics at play (Davenport et al., 2020). The findings underscore the importance of designing AI systems that evoke positive emotional responses and foster user trust, while also considering how negative emotions may vary based on the type of AI agent, whether physical (robot) or virtual (chatbot), and the level of intelligence portrayed.

This necessitates a careful integration of anthropomorphic characteristics to mitigate adverse reactions like fear and discomfort. Moreover, designers should prioritize transparency and reliability to reinforce trust in AI systems (Glikson & Woolley, 2020). From a business perspective, these insights stress the significance of monitoring user sentiment and feedback to identify potential issues and opportunities for enhancement that may not have been apparent during the design phase. Additionally, ethical considerations in AI deployment are paramount, encompassing issues such as data privacy, concerns about job displacement, and the opacity of AI decision-making processes, all of which must be addressed to ensure responsible and ethical use of AI technologies (Davenport et al., 2020).

Furthermore, this study underscores the lack of technical solutions for chatbot hallucinations, highlighting users' awareness of this phenomenon. Businesses should pay special attention to the potential ramifications of such service failures on user trust in AI systems. Overall, these implications emphasize the imperative for continued research, thoughtful design practices, and ethical considerations in the development and deployment of AI technologies.

Future research

Future research in the realm of AI adoption offers numerous promising avenues for exploration. Longitudinal studies could track the evolution of emotional responses to AI interactions over time, shedding light on how familiarity with AI systems impacts human emotions and behaviors (Luger & Sellen, 2016). Additionally, cross-cultural investigations present an opportunity to delve into the influence of cultural values and norms on emotional responses and trust in AI across diverse societies (Davenport et al., 2020). Such comparative studies can unveil cultural factors shaping the acceptance or rejection of AI technologies.

The role of anthropomorphism in AI adoption warrants further investigation as well. Understanding the optimal degree of anthropomorphism for AI systems is crucial, as it impacts user engagement and acceptance. Striking the right balance between human-like attributes and technological functionality is essential to design AI systems that are both relatable and embraced by users (Crolic et al., 2022). Exploring these avenues can enhance our understanding of AI adoption dynamics and inform the development of more user-centric AI technologies in the future.

Extensive investigation into the ethical implications of AI adoption is imperative. Research should delve deeply into issues like data privacy, job displacement, and algorithmic bias, all of which profoundly impact trust and emotional responses to AI (Davenport et al., 2020). Addressing these ethical concerns is essential for the responsible development and deployment of AI technologies.

Moreover, future research should explore AI's impact across diverse industries. While existing studies offer insights into AI adoption within sectors like hospitality and social media, a broader examination across domains such as healthcare, education, and transportation is warranted (Huang & Dootson, 2022). This comprehensive approach will provide a nuanced understanding of the

opportunities and challenges posed by AI in various contexts.

Furthermore, there's a need for research to focus on the phenomenon of hallucination and its longitudinal effects on consumers. Understanding how consumers respond to AI hallucinations in different contexts, particularly in high-risk versus low-risk industries, is crucial for developing strategies to mitigate potential negative impacts.

Contribution

This study extends the application of machine learning methodologies from previous research to investigate the cognitive and affective impact of AI-based technologies on social platforms. By doing so, it offers a more comprehensive understanding of how emotions and trust in AI manifest across various contexts (Hoyer et al., 2020). Additionally, the research highlights the limitations of traditional topic modeling techniques in uncovering latent topics within large datasets, emphasizing the importance and potential for future research to utilize these methods more effectively.

Moreover, this study introduces a novel approach to topic modeling on YouTube, an area that has received limited attention from scholars. The choice of YouTube as a platform is grounded in the belief that users engage more actively after being informed by content providers, thereby enriching the value of their interactions.

Overall, the contributions of this research have the potential to significantly enhance the existing literature on emotional responses and trust in AI. By expanding emotional frameworks, diversifying contextual applications, refining hybrid machine-human intelligence approaches, and deepening ethical considerations, this study offers valuable insights and perspectives on this critical subject matter.

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