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Deepfake Interest in South Korea: A Temporal Analysis of Google Trends from 2017 to 2024

Güney Kore'de Deepfake'e Yönelik İlgi: 2017'den 2024'e Google Trendlerinin Zamansal Analizi

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İnceleme Makalesi Rewiev Article

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ABSTRACT

Deepfake technology, which utilizes artificial intelligence to generate hyper-realistically manipulated videos, images, texts, and audio, has garnered significant public and academic interest. The proliferation of deepfakes, especially in non-consensual pornography, financial fraud and political misinformation, has sparked ethical, moral, legal, and security debates worldwide. While existing research predominantly focuses on deepfake detection, legal frameworks, and their potential impact on the democratic process, few studies have examined public interest in deepfakes and the factors influencing search behavior. This study addresses this gap by analyzing public interest in deepfakes in South Korea, using Google Trends data from January 2017 to August 2024. This timeframe is particularly significant as it encompasses the initial emergence of deepfake technology in 2017 and its increasing use in fraudulent and non-consensual content in South Korea. The country represents a unique case due to its global leadership in deepfake-related searches, widespread consumption of non-consensual sexual deepfakes, and frequent occurrence of deepfake fraud. This study employs dictionary-based text analysis to categorize search queries into three main themes: sexual content, techniques for creating deepfakes, and methods for accessing deepfake materials. The findings indicate that 77.81% of searches are related to non-consensual sexual content, primarily targeting female celebrities. Contrary to global trends, political deepfakes did not significantly influence search patterns in South Korea. These insights highlight the urgent need for stronger regulatory frameworks and technological interventions to mitigate the harms associated with deepfakes.

Keywords: Deepfake, Google Trends, South Korea, Dictionary-based Text Analysis, Temporal Analysis.

ÖZ

Hiper-gerçekçi manipüle edilmiş videolar, görüntüler, metinler ve sesler üretmek için yapay zekadan yararlanan deepfake teknolojisi hem toplum hem de akademik camia için ilgi çekici bir konu haline gelmiştir. Özellikle rıza dışı pornografi, dolandırıcılık ve siyasi yanlış bilgilendirmede deepfake'lerin yaygınlaşması, dünya çapında etik, ahlaki, hukuksal ve güvenlik bazında tartışmalara yol açmıştır. Mevcut araştırmalar ağırlıklı olarak deepfake tespiti, hukuki çerçeve ve deepfake içeriklerin demokratik süreçler üzerindeki potansiyel etkilerine odaklanırken, kamuoyunun deepfake'lere olan ilgisini ve arama davranışını etkileyen faktörleri inceleyen sınırlı sayıda çalışma bulunmaktadır. Bu doğrultuda bu çalışmada, Ocak 2017'den Ağustos 2024'e kadar olan Google Trendler verileri kullanılarak, Güney Kore vakasında deepfake'lere olan kamu ilgisi analiz edilmek suretiyle literatürdeki mevcut boşluk doldurulmaya çalışılmıştır. Bu zaman dilimi, deepfake teknolojisinin 2017 yılında ilk ortaya çıkışını ve Güney Kore'de dolandırıcılık ve rıza dışı içeriklerde artan kullanımını kapsadığı için özellikle önemlidir. Güney Kore, deepfake ile ilgili aramalarda küresel liderliği, rıza dışı cinsel deepfake'lerin yaygın tüketimi ve deepfake dolandırıcılığı gibi sorunlarla sıkça karşılaşılması nedeniyle benzersiz bir vakayı temsil etmektedir. Bu çalışmada, arama sorgularını üç ana temada kategorize etmek için sözlük tabanlı metin analizi kullanılmıştır. Bu sözlükler cinsel içerik, deepfake oluşturma teknikleri ve deepfake materyallerine erişim yöntemleridir. Bulgular, aramaların %77,81'inin rıza dışı cinsel içerikle ilgili olduğunu ve özellikle kadın ünlüleri hedef aldığını göstermektedir. Küresel eğilimlerin aksine, siyasi deepfake'ler Güney Kore'deki arama davranışlarını önemli ölçüde etkilememektedir. Bu bulgular, deepfake'lerle ilişkili zararları azaltmak için daha güçlü düzenleyici çerçevelere ve teknolojik müdahalelere duyulan acil ihtiyacı vurgulamaktadır.

Anahtar Kelimeler: Deepfake, Google Trendler, Güney Kore, Sözlük Temelli Metin Analizi, Zamansal Analiz

Introduction

In recent years, advances in artificial intelligence (AI) have led to the development of algorithms capable of generating content that is nearly indistinguishable from real images, videos, audio, and text (Chesney & Citron, 2019). One of the most prominent technologies for generating content is deepfake technology. Interest in deepfakes has significantly increased among both the public and the academic community, especially after a deepfake video of a manipulated image of a female Hollywood celebrity was uploaded to Reddit in 2017 (Tulga, 2024). Consequently, numerous scholars from various countries have concentrated their research on deepfakes, leading to a steady annual increase in academic studies on the topic. Although these studies are abundant, they have offered different definitions of deepfake. For instance, Bates (2018) defined deepfakes as AI-based software capable of superimposing an individual's face onto an existing image or video. In contrast, Chesney and Citron (2019) define deepfakes as a digital manipulation of audio, image or video that is highly realistic and challenging to detect. Despite these varying definitions, deepfakes can be succinctly defined as hyper-realistic videos, images, text, and audio that are digitally manipulated to portray individuals saying or doing things that never occurred, utilizing "deep learning" technology to generate "fake" content (Tulga, 2024; Shin & Lee, 2022).

In recent years, tools and techniques for producing deepfakes, such as FakeApp and Nudify, have become increasingly sophisticated and accessible (Gamage et al., 2022; Shin & Lee, 2022). This accessibility has empowered many individuals to create convincing fake text, videos, audio, or images that depict people performing actions or saying things that never occurred in reality (Shin & Lee, 2022). Unlike cheapfakes or shallowfakes—videos that are edited or partially distorted but still contain real footage—deepfakes use images or voices of a person to generate expressions and behaviors that never actually took place. This has resulted in a steady increase in malicious deepfakes being used for harmful purposes (Currie et al., 2019). The growing proliferation of malicious deepfake content across websites and social media platforms has heightened concerns among institutions, decision-makers, and the academic community (Gamage et al., 2022; Cho et al., 2023; Shin & Lee, 2022; Tulga, 2024). Furthermore, the increasing proliferation of non-consensual sexual videos or images, as well as manipulative content involving political figures, has exacerbated these concerns (Kietzmann et al., 2020; Cho et al., 2023).

For instance, in 2017, deepfake technologies were first used to create sexual content featuring the faces of celebrities. In 2019, a British energy company fell victim to a scam involving audio deepfake technology (Tulga, 2024). Furthermore, in May 2023, deepfake images depicting a fire near the Pentagon, created for political manipulation, incited turmoil in the U.S. stock market, resulting in a decline (Cho et al., 2023). This incident exemplifies how politically motivated deepfakes can impact society and the economy by spreading false information (Cho et al., 2023). It has been argued that deepfake texts, images, videos, and audio—particularly those used for political manipulation and involving political figures—have the potential to sway public opinion, exploit cognitive biases, and weaponize inherent vulnerabilities to influence elections and political processes, ultimately eroding trust in political figures, governments, and institutions (Gieseke, 2020).

Due to these negative developments, deepfakes have garnered significant attention within the academic community and have become a topic of intense research. Accordingly, most academic studies on deepfakes have focused on elucidating the technology behind deepfakes (Bates, 2018; Kietzmann et al., 2020), algorithmic and human approaches to detecting deepfake content (Masood et al., 2023), and the legal issues associated with deepfakes (Gieseke, 2020; Maras & Alexandrou, 2019). Additionally, other studies in the literature have examined the effects of sexual deepfake content on individuals, as well as the

manipulation of political and financial processes through these technologies (Öhman, 2020; Chesney & Citron, 2019).

However, despite existing studies, there has been limited research on individuals' interest in deepfakes, the events that shape this interest, the content of deepfake-related internet searches, and the temporal changes in this content, especially in South Korea. South Korea was selected as the primary case for this study due to its leading global interest in deepfake-related searches, the significant prevalence of non-consensual sexual deepfake content, and the increasing use of deepfake technology for fraudulent activities and reputational harm since 2018 (Oaten & Lee, 2024).

This study analyzes the interest in deepfakes from January 2017 to August 2024. The selected date range allows for an analysis of public interest in deepfakes from 2017, the year when the first deepfake content was uploaded to the internet, to August 2024, when South Korea encountered significant challenges related to deepfake content. The R programming language is used in this study to examine trends in deepfake interest by analyzing Google data specific to South Korea. The study focused on and aimed to address three main research questions.

- What is the level of interest in deepfakes in South Korea?
- What are the predominant topics of deepfake-related Google searches in South Korea?
- How have the predominant topics of deepfake-related Google searches in South Korea evolved over time?

The following sections provide a comprehensive analysis of the literature on deepfake, explain the rationale for selecting the South Korean case, and detail the significance of the Google data along with the steps taken in the analysis. The findings are presented in the fifth section, followed by a summary of the main findings and their alignment or divergence from the existing literature. The study concludes with the conclusion section.

Literature Review

Deepfake technology was officially introduced to the public in 2017 when a user uploaded a deepfake video to Reddit. Since then, it has garnered significant attention from the academic community, institutions, and the general public (Tulga, 2024). Since 2017, numerous scholars and institutions have conducted academic studies and produced reports and books on deepfakes, with the number of such studies consistently increasing each year. Research focusing on the detection of deepfake content and the legal implications of deepfakes are the two most prominent topics among these studies, with their numbers continuing to grow annually (Godulla et al., 2021).

Many studies of deepfake content detection, primarily conducted by scholars in the field of computer science, focus on evaluating the effectiveness of algorithms in detecting deepfakes (e.g., Lee & Kim, 2021), while others examine human perception and ability to detect such content (e.g., Murphy & Flynn, 2022). Additionally, some studies compare the detection capabilities of algorithms and humans (e.g., Groh et al., 2022). On the other hand, most studies examining the legal dimensions of deepfake content —another prominent topic— are conducted by scholars in the field of law and primarily investigate the legal frameworks required to mitigate the potential risks associated with deepfakes (Mania, 2024).

In recent years, several academic studies have concentrated on the opportunities offered by deepfake content, as well as the potential negative effects of deepfakes on individuals, institutions, and countries, rather than focusing solely on detection and legal considerations (Kietzmann et al., 2020; Masood et al., 2023). While the majority of research on the opportunities afforded by deepfakes emphasizes their potential benefits for the fashion, advertising, and entertainment industries, studies that investigate the harms of deepfake content address critical issues such as the well-being of individuals and institutions, reputational damage, increased instances of fraud, adverse effects on political processes, and the

manipulation of public opinion through deepfakes (Wagner & Blewer, 2019).

However, there is limited research on the social implications of deepfakes, particularly regarding how individuals use, perceive, and interact with these technologies, as well as their interest in them. Specifically, there is a lack of understanding of how communities and individuals who consume deepfake texts, videos, or images perceive and conceptualize these materials.

In this context, a study was conducted by Vosoughi et al. (2018) that examined the opinions of online communities regarding deepfakes. The authors utilized Twitter data and found that both deepfake content and fake news spread faster and more widely online than genuine information, thereby reaching a wider audience on Twitter (Vosoughi et al., 2018). Similarly, Twomey et al. (2023) analyzed tweets related to deepfakes and the Russia-Ukraine war to investigate public reactions to deepfake content associated with the war. They found that deepfakes have theoretically eroded trust. The authors argue that deepfake content on Twitter cultivates skepticism and fuels conspiracy theories, with this skepticism subsequently spreading to a broader audience through the platform (Twomey et al., 2023).

Certain academic studies have shifted their focus to Reddit, where deepfake-produced content was initially posted, rather than relying on Twitter data for their analyses. One noteworthy study in this domain was conducted by Gamage et al. (2022). The authors scrutinized deepfake conversations on Reddit spanning from 2018 to 2021. Their analysis revealed that deepfake-related posts on Reddit tended to endorse the creation, production, and sharing of deepfake content without regard for potential consequences (Gamage et al., 2022). Moreover, the authors observed that a significant portion of Reddit discussions revolved around popular topics such as politics, pornography, and skepticism regarding the authenticity of deepfake images and videos (Gamage et al., 2022). Similarly, Kikerpill et al. (2021) argued that Reddit users advocate for the inclusion of even illegal and degrading content, such as sexually explicit material generated with deepfake technology, within the realm of free speech, thereby justifying its sharing on the platform.

Some studies in the literature focus on identifying the dominant sentiment in posts and analyzing the prevalent emotions in deepfake-related content, rather than exploring the main themes of such posts on social media platforms. In this context, Young Ah Lee et al. (2021) examined 10 deepfake videos on YouTube and analyzed 2,689 comments related to them using sentiment analysis. The authors concluded that a significant portion of the comments displayed a neutral sentiment. Furthermore, they found that the nature of the video and the number of dislikes had a considerable impact on viewers' emotions (Lee et al., 2021). In contrast, Twomey et al. (2023) discovered that Twitter users generally expressed predominantly negative emotions toward deepfakes and deepfake-related news. The authors also concluded that Twitter often responded to deepfake-related news with emotions such as negativity, fear, anxiety, shock, and confusion (Twomey et al., 2023).

However, the existing literature focuses primarily on social media platforms with relatively small user populations, such as Twitter and Reddit, or on comments related to deepfake videos on YouTube. Consequently, these studies fail to provide a comprehensive framework for understanding global perspectives and interests in deepfakes, or in specific cases. In this regard, Google, the world's largest and most widely used search engine, plays a crucial role. Analyzing Google data enables a broader understanding of public perceptions and interests in deepfakes. Therefore, this study uses Google data to investigate the interest of South Koreans in deepfakes. Specifically, it analyzes South Koreans' Google searches concerning deepfakes, focusing on their level of interest, the temporal fluctuations of this interest, the general content of the searches, and the changes in that content over time, employing a dictionary-based

analysis method. The following section of the study explains the significance of the South Korean case in relation to the deepfake phenomenon and the rationale behind its selection.

Case Selection

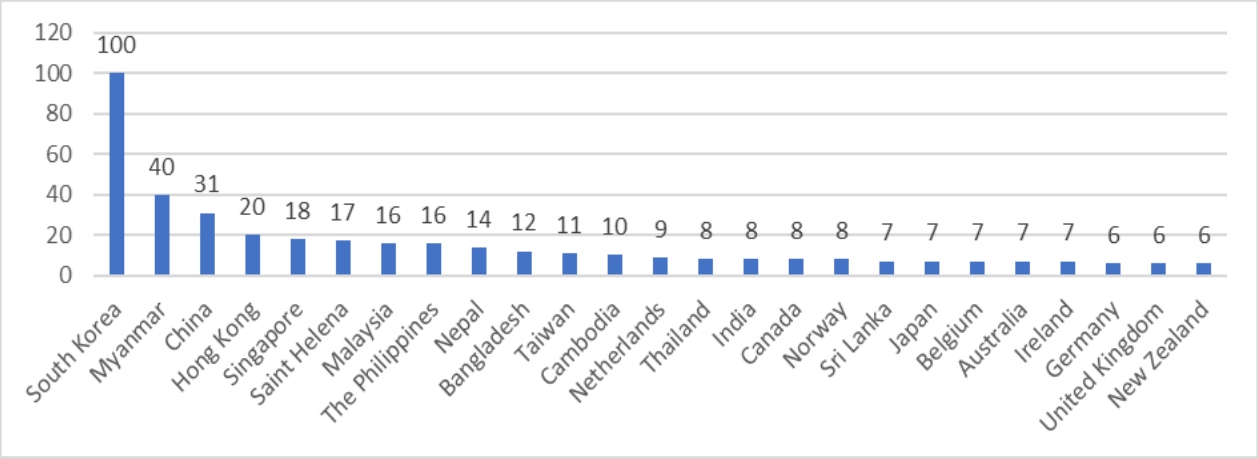
There are three main reasons why South Korea was chosen as the primary case for this study. The first reason is that South Korea ranks first in global Google searches related to deepfake, a metric that is also utilized in all analyses conducted in this study.

Directly related to the first reason, a comparison of deepfake-related Google searches in South Korea with those worldwide reveals that searches in South Korea exceeded global searches from late 2017 to early 2023.

The second main reason for selecting South Korea as the focal case in this study is the notable prevalence of deepfake content in the country since 2018 (Monique et al., 2024). Sexual deepfake content, in particular, poses a significant challenge in South Korea. For instance, investigations have revealed that "sexually explicit" videos featuring manipulated videos and images—predominantly of women and girls—were being disseminated through online chat groups associated with schools and universities in South Korea (Oaten & Lee, 2024). These investigations found that at least 500 female students from various educational institutions were adversely affected by such deepfake content within a single week. Additionally, the Ministry of National Defense reported that 24 female military personnel had fallen victim to these deepfake incidents (Oaten & Lee, 2024). The ministry also

Figure 1

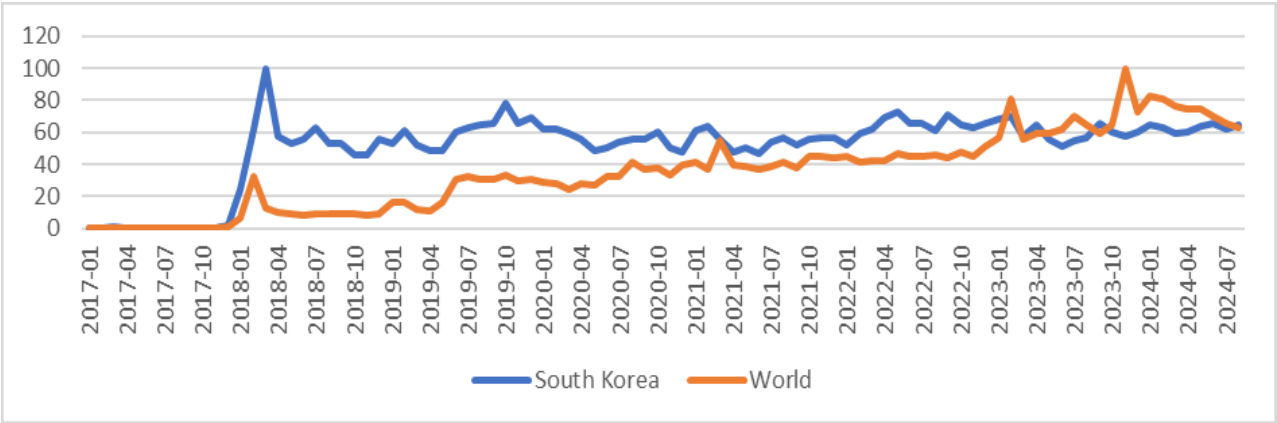
Deepfake Search Frequency in the World



Reference: Google Trends, 2024

Figure 2

Comparison of Google Searches for Deepfake in South Korea and Worldwide



Reference: Google Trends, 2024

announced that photos of soldiers, as well as army and ministry officials, had been removed from the internal communication network due to the risk of their misuse in creating "fake sexually explicit images and videos." In response to this issue, the South Korean government is currently drafting new legislation aimed at preventing the dissemination of non-consensual sexual deepfake content (Lyons, 2024). Law enforcement agencies have begun arresting individuals responsible for distributing such material (Monique et al., 2024).

The third and final reason for selecting South Korea as a case study in this research is that, similar to many countries worldwide, deepfake content has been increasingly used for fraudulent purposes in South Korea in recent years. A notable instance of this occurred in April 2024, when a South Korean woman was defrauded of 50,000 USD using deepfake technology (Uyan, 2024).

For these three main reasons, the South Korean case is the focal point of this study, and all analyses are concentrated on it. The data, methodologies, and procedures used in examining the South Korean case are explained in detail in the following chapter of the study.

Research Design

Focusing on the South Korean context, this study utilizes Google data to examine searches related to deepfakes. It covers the period from 2017, when the first deepfake video was uploaded to Reddit, to August 2024.

Big data, such as data from Google, is essential for researchers examining public opinion on political, technological, social, and cultural developments in significant cases such as South Korea (Tulga, 2023). In recent years, scholars have emphasized the contribution of Google Trends analyses to social science research, particularly in understanding the public's thoughts, behaviors, opinions, and interests on various issues (Vosen & Schmidt, 2011; Tulga, 2023). In particular, the relatively low usage rate of Twitter (now known as X), combined with issues such as selection bias and sensitivity bias in survey analyses, renders Google data an indispensable resource for understanding individuals' views, thoughts, and interests on various topics, including deepfakes, across different countries worldwide (Tulga, 2023). Therefore, this study examines Google Trends data to determine South Koreans' interest in deepfakes, as they rank first globally in Google searches for this topic. The study also explores the specific topics of this interest and the temporal changes associated with them. The R programming language, specifically the "gtrendsR" and "trendecon" packages, is used to access and analyze the data.

The study began by accessing Google Trends data. First, a keyword was selected to effectively capture South Koreans' interest in deepfakes and related topics. The careful selection of the term for analysis in Google Trends ensures a more accurate, direct, and comprehensible representation of people's preferences and orientations (Scharkow & Vogelgesang, 2011; Tulga, 2023). Google Trends is not case-sensitive, and it is sufficient to enter the search keyword in English (Mavragani & Ochoa, 2019; Scharkow & Vogelgesang, 2011; Rovetta, 2021). Google automatically translates the entered keyword into the local language (Tulga, 2023; Rovetta, 2021). Consequently, the keyword "deepfake" was chosen as the focal point of this study.

The obtained dataset shows weekly searches for deepfake in South Korea. These weekly datasets were subsequently converted into monthly data. While weekly Google Trends data are most effective for analyzing short-term trends, monthly data offer a more accurate representation of long-term trends (Eichenauer et al., 2022; Tulga, 2023). Consequently, the weekly data were averaged and converted to monthly data. The average of the data was calculated using the following formula:

$$X_{\text{Monthly Average}} = \frac{X_{\text{Sum of All Data Points (Weekly)}}}{X_{\text{Number of Data Points}}} \quad (1)$$

Table 1

Accessing Google Data

Google Trends Process	
Type of Search	Web Search
Category	All Categories
Start Date	2017-01-01
End Date	2024-08-31
Search Term	deepfake
Data Type	Weekly
Formula	gtrends(keyword = c("deepfake"), geo = "KR," time = "2017-01-01 2024-08-31," gprop = "web")
R Package	gtrendsR and trendecon
Number of Observations	368
Mean	51,37
Standard Deviation	21,62
Min.	0
Max.	100

Following the conversion of weekly data into monthly data, daily data on deepfake searches from January 2017 to August 2024 were obtained using the "trendecon" package. This analysis aimed to identify the specific dates and developments that most significantly influenced South Koreans' perceptions of deepfakes. The daily data were then meticulously examined. These two steps are designed to answer the first research question.

Analyses are then conducted to answer the second and third research questions. In this context, the first step is to identify the 20 most frequently searched terms related to deepfakes in South Korea from January 2017 to August 2024. Discovering these terms provides valuable insights into the issues shaping South Koreans' interest in deepfakes and related topics, as well as the underlying reasons for this interest (Tulga, 2024). The study further examined the most searched terms related to deepfakes on an annual basis to better capture the evolving nature of deepfake-related topics over the years.

Following the identification of the most frequently searched terms, a comprehensive analysis of the general content of deepfake-related searches in South Korea and their evolution over time was conducted using a dictionary-based approach. Dictionary-based text analysis is a form of computer-aided text analysis in which texts are transformed into word frequency counts linked to specific constructs through the use of dictionaries—collections of terms believed to correspond with particular concepts or topics (Neuendorf, 2016; Short & Palmer, 2008). This technique treats texts as collections of words, meaning that the analysis is not influenced by the placement or order of words within the text (Short & Palmer, 2008). Compared to traditional manual content analysis, the dictionary-based method significantly enhances the efficiency of text categorization (Guo et al., 2016). In its simplest form, researchers compile lists of keywords related to the themes they aim to identify in the text (Guo et al., 2016). The computer subsequently searches for these terms within the analyzed text and annotates the corresponding unit as containing the identified theme if any word from the list appears (Guo et al., 2016).

Three dictionaries were prepared under the categories of "sexual," "technical," and "to find deepfake content." Numerous studies in the

literature suggest that interest in deepfakes tends to increase during political processes such as elections (Tulga, 2024; Gamage et al., 2022; Maddocks, 2020). However, an analysis of trends and most search terms in South Korea revealed that political processes did not influence interest in deepfakes in this case. For example, no politically related terms or figures appeared among the most searched terms. Consequently, a political dictionary was not included in the study.

There are two main reasons for conducting the analysis using these three dictionaries. The first reason is that findings from the literature support this approach (Gamage et al., 2022; Tulga, 2024). The second reason stems from an analysis of the most frequently searched deepfake-related terms on Google, all of which directly corresponded to the prepared dictionaries (Quinn et al., 2010). The results of the analysis further validated these two reasons, demonstrating that 98.4% of the terms in the Google searches matched the prepared dictionaries.

The dictionary-based analysis process involved searching records for a predefined set of words and assigning a prevalence score to each term (Bonikowski & Gidron, 2016; Tulga, 2024; Vargo et al., 2014; Quinn et al., 2010). First, the study manually compiled lists, or "dictionaries," for "sexual content," "technical content," and "to find deepfake content." Following the recommendations of Kiousis (2004), Vargo et al. (2014), Quinn et al. (2010), and Bonikowski and Gidron (2016) for compiling a dictionary, an extensive review of the literature related to deepfakes was conducted to identify potentially relevant terms. Consequently, three dictionaries were developed: one for "sexual content," one for "technical content," and one for "finding deepfake content." The sexual content dictionary comprises 87 terms, including "sex," "porn," "nsfw," "nude," and "milf." The technical content dictionary contains 63 terms, such as "create," "program," "software," "system," and "app." Finally, the dictionary for finding deepfake content includes 59 terms, including "vpn," "website," "Twitter," "Discord," and "Telegram." To minimize false positives, these dictionaries underwent a cleaning process, and all terms were represented as unigrams. Since Google provides all data in English, all dictionaries created are also prepared in English.

It is essential to assess whether the predetermined list accurately represents the entire dataset and ensures reliability (Vargo et al., 2014; Conway, 2010). To achieve this, two main steps were undertaken to ensure the reliability and robustness of the dictionaries and dictionary-based analyses. The first step was to assess the reliability of the dictionaries by examining the match rates between the analyzed terms and the dictionaries. The analysis revealed a 98.4% match between the prepared dictionaries and the Google search terms. The second step concentrated on evaluating the reliability of the analyses. To test the robustness, the dictionaries were randomly divided into two parts, and the analyses were repeated—a procedure referred to as the "split-half test" in the literature (Tulga, 2024). This robustness test yielded similar results, further demonstrating the reliability of the analysis.

The research continued by examining the temporal changes in the content of deepfake-related searches in South Korea. In this phase, three dictionaries were utilized to identify general content and to explore how the content of deepfake-related searches evolved over time, thereby completing the analysis.

Results

To answer the first research question, the study began by analyzing monthly Google Trends data on deepfakes in South Korea from January 2017 to August 2024. The analysis indicated that interest in deepfakes began to increase in December 2017, and peak in March 2018. Although there was a slight decline in interest after March 2018 the level of interest remained relatively high through August 2024. The average level of interest between April 2018 and August 2024 fluctuated between 47 and 78.

Some studies in the academic literature suggest that individuals' interest in deepfakes tends to increase during election periods (Tulga, 2024). Accordingly, this study aimed to determine whether elections in South Korea impacted public interest in deepfakes. Between January 2017 and August 2024, the timeframe covered by the dataset, South Korea held two presidential and two legislative elections. However, an examination of the monthly trends revealed that political processes in South Korea, including these elections, did not significantly influence interest in deepfakes.

In the second step of the study, after analyzing monthly Google Trends, daily trends were examined to identify specific dates that directly influenced interest in deepfakes. Three significant dates emerged from this analysis. The first was March 19, 2018, when interest peaked. The main event that drove this spike was the online circulation of a deepfake video featuring K-Pop star Kim Seol-hyun. The second notable date was October 10, 2019, when interest in deepfakes remained relatively high. On this date, the focus shifted to deepfake production, with many searches seeking technical information on how to create deepfakes. Finally, the third date, February 27, 2021, also exhibited heightened interest, similar to October 10, 2019, with searches centered around deepfake production and technical details. On both of these latter dates, interest in deepfake production was a key driver of search activity.

After analyzing both monthly and daily trends, further analyses were conducted to address the second research question of the study. In this context, the primary focus was on examining the terms that South Koreans most frequently searched for on Google regarding deepfakes. The goal was to identify the most commonly searched terms and provide partial insights into the general content of these searches. Unsurprisingly, the most searched term was "deepfake." An analysis of the 20 most frequently searched terms revealed that the names of K-pop stars, such as NewJeans

Figure 3

Monthly Deepfake Trends in South Korea

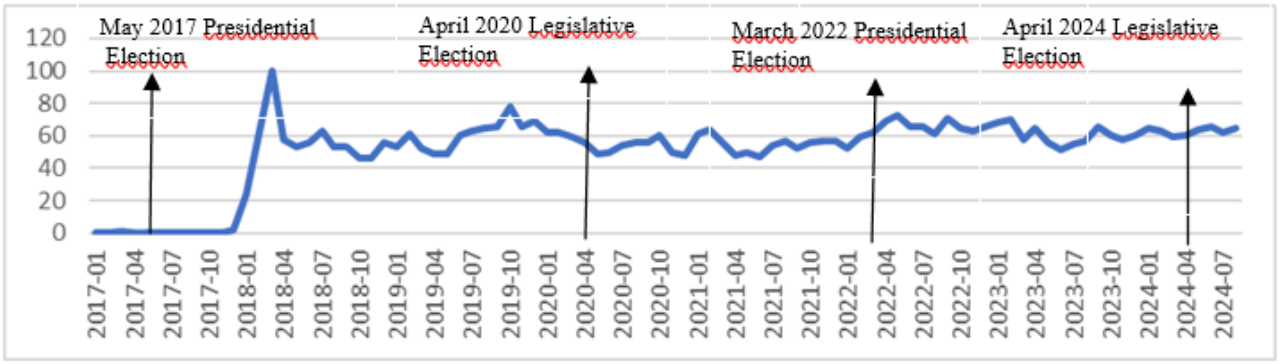
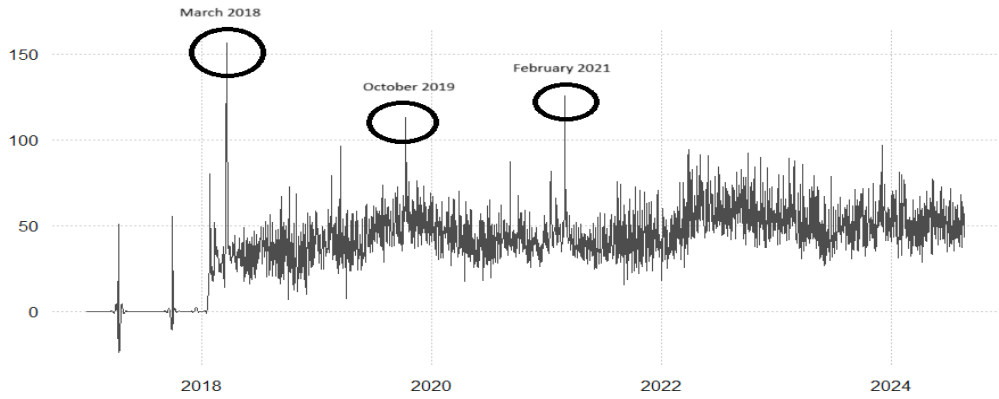


Figure 4

Daily Deepfake Trends in South Korea



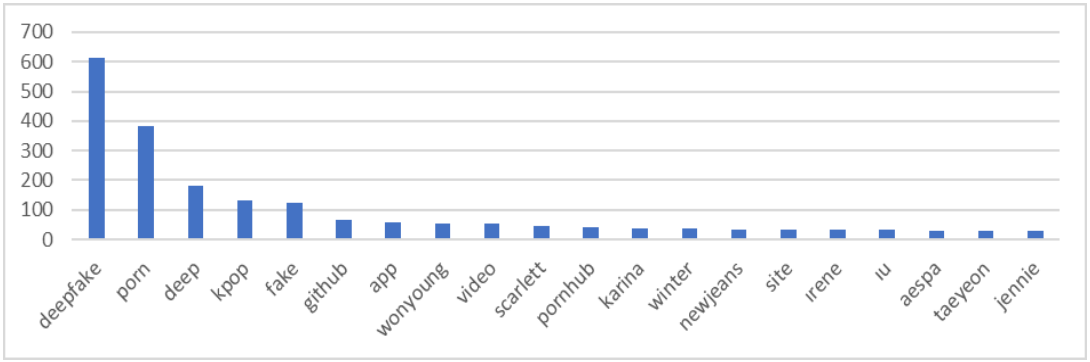
and Irene, as well as foreign celebrities like Scarlett Johansson, dominated the list. In addition to the names of Korean and foreign celebrities, sexually explicit terms such as "porn" and "pornhub," along with terms directly related to deepfake production, such as "github" and "app," were also among the most searched terms.

began arresting numerous individuals in 2021 to curb the dissemination of such material (Monique et al., 2024). The prominence of the term “deepfake viewing punishment” in 2021 reflects the surge in arrests during that period.

After identifying the most frequently searched

Figure 5

Most Searched Terms Related to Deepfake in South Korea



When examining the most searched terms by year, the results were consistent with the overall most searched terms. The names of South Korean and international celebrities, sexual content, and terms related to deepfake production ranked among the most searched terms across all years. However, 2021 is particularly noteworthy. One of the most searched terms that year was “deepfake viewing punishment.” In response to the increasing prevalence of sexual deepfake content online, South Korean law enforcement

terms overall and by year, a dictionary-based analysis was conducted to determine the general content of Google searches. The analysis revealed that 77.81% of the searches were related to sexual deepfake content. Of these, 61.14% involved sexual content concerning South Korean female celebrities, while 15.79% was associated with foreign female celebrities. Furthermore, it was concluded that all sexual content related to both South Korean and foreign celebrities targeted female figures.

Figure 6

Most Searched Terms Related to Deepfake in South Korea by Year

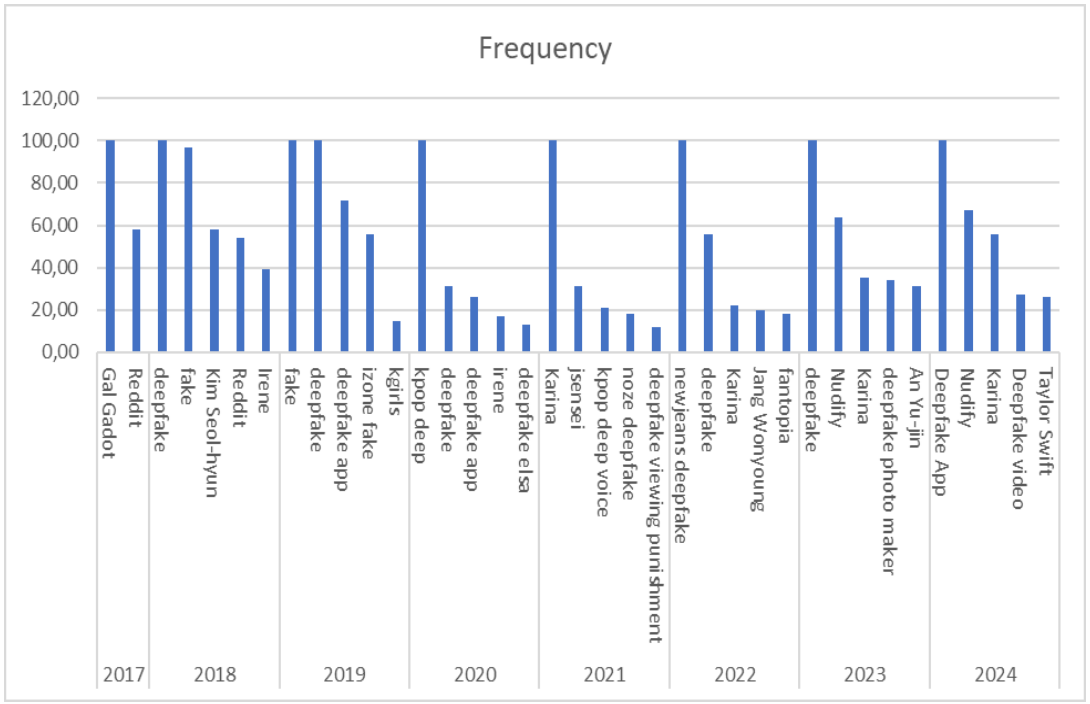


Table 2

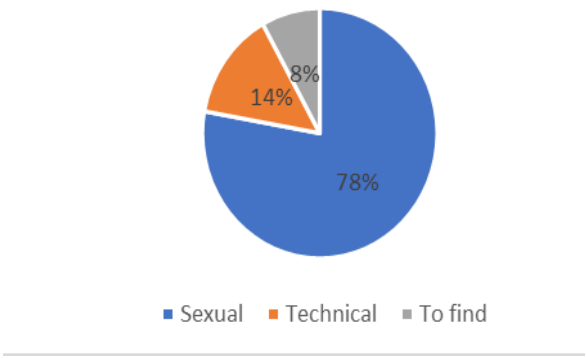
Example for Each Content

Content	% (percentage)		Example
Sexual	77,81	23,06 (General Sexual)	korean deepfake porn
		61,14 (Sexual Related to Korean)	Kim Seolhyun porn deepfake
		15,79 (Sexual Related to Foreigner)	Scarlett Johansson porn
Technical	14,09		How to create deepfake
To find	8,09		deepfake website

On the other hand, the second most prevalent category of searches pertained to technical information regarding deepfake production, accounting for 14.09% of the total searches. Additionally, 8.09% of the overall content consisted of searches aimed at finding deepfake content.

Figure 7

Distribution of General Content

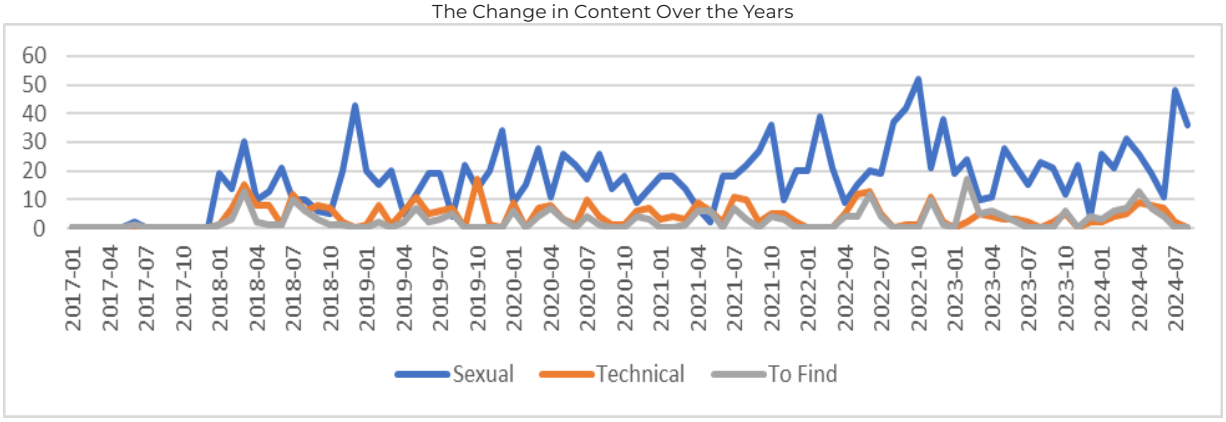


In the final stage of the study, the changes in the content of Google searches over the years were analyzed to answer the third research question. The analysis revealed that sexual deepfake content, particularly searches related to South Korean and foreign female celebrities, was generally the most frequently searched category. However, searches for technical information on deepfake production, the second most dominant category overall, temporarily surpassed sexual content in July and September 2018, October 2019, and April and May 2021. Nevertheless, these shifts were short-lived, and in the following months, searches for sexual content once again exceeded those for technical information.

Searches for deepfake content on the internet, the third most commonly searched topic overall, surpassed inquiries for technical information about deepfake production in June 2017, as well as in February, April, and October 2023, and March and April 2024, making it the second most dominant topic during these periods. However, in other months, interest in searches for deepfake content was lower than for other topics.

Figure 8

The Change in Content Over the Years



Conclusion

Deepfake technology gained prominence in 2017 when a Reddit user uploaded a sexually explicit video created using this technology. In recent years, the proliferation of deepfake text, audio, videos, and images—often generated for malicious purposes and widely circulated on the internet and social media platforms—has become a growing source of concern (Maddocks, 2020). One major reason for this concern is the use of deepfake technology to algorithmically superimpose the faces of female celebrities onto other bodies, typically in pornographic contexts (Jacobsen & Simpson, 2023). Non-consensual pornographic content continues to represent the majority of deepfakes available on the internet today (Cho et al., 2023; Tulga, 2024).

The rise of deepfake content targeting politics and political figures is another significant source of concern. This concern stems primarily from the potential for fake news and deepfake content about political figures to adversely affect individuals' political behavior and decision-making processes (Di Domenico & Visentin, 2020). Numerous academic studies indicate that deepfakes targeting political figures can mislead the public and result in serious societal repercussions (Di Domenico & Visentin, 2020; Kwok & Koh, 2021).

For these reasons, the academic community has closely followed developments related to deepfakes. Each year, numerous studies examine various aspects of this issue, and the volume of research continues to expand. However, limited attention has been paid to the public interest in deepfakes, the factors influencing this interest, and the temporal fluctuations in internet searches related to deepfakes. In particular, few studies have examined public interest in deepfakes in South Korea, a country where deepfakes have attracted significant attention since 2018 but are also frequently exploited for fraud, pornography, and reputational damage.

In this context, this study aims to provide a comprehensive temporal analysis of public interest in deepfake technology in South Korea, using Google Trends data from 2017 to 2024. The analysis yielded significant findings regarding the evolution of deepfake-related searches, the factors influencing public interest, and the differences between trends in South Korea and those globally. These findings contribute to the existing literature by revealing the dominant themes in deepfake-related searches, identifying key moments of heightened interest, and highlighting South Korea's unique search patterns. Some findings align with previous academic studies, while others present notable divergences.

One of the most significant findings is that public interest in deepfakes in South Korea surged in late 2017 and peaked in March 2018, mirroring global trends observed in other studies (Tulga, 2024; Gamage et al., 2022). Öhman (2020) and Gamage et al. (2022) similarly reported that deepfakes, which first emerged in 2017, gained substantial popularity in early 2018. The study also confirms that interest in deepfakes has remained consistently high in South Korea, with periodic spikes driven by high-profile incidents, such as the circulation of deepfake videos featuring K-pop stars. However, contrary to previous research suggesting that political events, such as elections, drive interest in deepfake-related content (Schiff et al., 2022; Kwok & Koh, 2021), this study found no significant increase in deepfake-related searches in South Korea during election periods. This underscores the importance of considering country-specific factors, such as media regulations, the political climate, and public awareness, when analyzing the impact of deepfake technology. Further research is needed to explore why South Korea deviates from the deepfake-related trends observed in other countries.

An analysis of daily search trends revealed three significant spikes in deepfake-related searches: March 19, 2018; October 10, 2019; and February 27, 2021. The spike on March 19, 2018, coincided with the release of a deepfake video featuring K-pop star Kim Seol-hyun, which significantly increased public interest.

A crucial finding is that deepfake-related searches often involved K-pop stars, such as NewJeans and Irene, as well as international celebrities like Scarlett Johansson. Additionally, sexually explicit terms such as "porn" and "Pornhub" dominated the list of most searched terms. This finding aligns with previous studies. Gamage et al. (2022) reported that the terms "porn," "video," "nude," and the names of various celebrities were among the most frequently used terms.

In addition to identifying the most frequently searched terms, the study also examined search term trends by year. The findings indicate that South Korean and foreign celebrities, sexual content, and terms related to deepfake production have remained consistently among the most searched words. However, 2021 marked a significant shift, as the search term "deepfake viewing punishment" gained prominence. This increased interest coincided with South Korean law enforcement's crackdown on deepfake content, resulting in numerous arrests. This trend highlights the impact of legal actions and policy responses on public engagement with deepfake technology.

Another key finding is the overwhelming dominance of non-consensual sexual content in deepfake-related searches. The study reveals that 77.81% of all searches pertain to sexually explicit deepfake content, primarily targeting female celebrities. This supports previous research indicating that most deepfake content online involves the sexual objectification of women (Jacobsen & Simpson, 2023; Laffier & Rehman, 2023; Murphy et al., 2023). Specifically, in South Korea, the widespread popularity of K-pop stars appears to have driven a significant portion of deepfake-related searches, reinforcing previous research on the intersection of gender, celebrity culture, and digital exploitation (Kim, 2018; Kang, 2021; Wang & Kim, 2022). These findings underscore the urgent need for stronger legal frameworks and technological interventions to combat the widespread misuse of deepfake technology for gender-based harm.

Furthermore, while sexual content has consistently dominated search trends, this study reveals that interest in deepfake production techniques temporarily surpassed searches for sexual content during July and September 2018, October 2019, and April 2021. However, these spikes were short-lived, with searches for sexual content resuming their dominance shortly thereafter. This pattern suggests that while there is some curiosity regarding deepfake creation, the primary driver of public searches remains the consumption of non-consensual content rather than a desire for technical knowledge.

Despite the contributions of this study, there is room for improvement in future research. While Google Trends data effectively captures online search behavior, it does not provide insights into offline discussions or the motivations behind specific searches. Furthermore, this study does not fully explain why political deepfake content failed to generate significant search interest in South Korea, in contrast to other countries.

Future research should incorporate qualitative methods, such as interviews or surveys, to explore individual motivations and perceptions regarding deepfake content. Comparative studies analyzing deepfake search trends across multiple countries could also provide deeper insights into the cultural and political factors influencing public engagement with deepfake technology.

This study highlights that deepfake technology in South Korea is primarily associated with non-consensual sexual content rather than political misinformation. These findings emphasize the urgent need for stronger regulatory frameworks and technological measures to combat the increasing misuse of deepfake technology, particularly in relation to gender-based digital exploitation. Additionally, this research contributes to broader discussions on digital ethics, privacy, and the societal implications of manipulating deepfake content. By providing a case study on the interest in deepfakes in South Korea, this

study emphasizes the importance of considering cultural and geopolitical contexts when analyzing the evolution and consumption of emerging technologies.

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Genişletilmiş Özet

Bu çalışma, ilk defa deepfake teknolojisi kullanılarak hazırlanan bir içeriğin internete yüklendiği tarih olan 2017 ile Güney Kore'de deepfake teknolojisinin dolandırıcılık ve rıza dışı içeriklerde sıkça kullanıldığı 2024 yılları arasındaki Google Trendler verilerini analiz ederek Güney Kore'de deepfake içeriklere yönelik kamu ilgisini incelemektedir. Deepfake içerikler, toplumsal, politik ve etik yansımaları nedeniyle akademik araştırmalarda önemli ve sıkça üzerinde durulmaya başlanan bir konu olarak öne çıkmaktadır. Bu araştırma, deepfake konusuna ve içeriklere olan ilginin düzeyini ve doğasını, yüksek hacimli deepfake ile ilgili aramalarla karakterize edilen bir ülke olan Güney Kore'de zaman içinde nasıl geliştiğini ve değiştiğini anlatmayı amaçlamaktadır. Çalışmada, Güney Kore özelinde bireylerin deepfake ile ilgili Google aramalarının baskın temaları belirlenmiş ve deepfake'e yönelik kamu ilgisinin zaman içindeki değişimi incelenmiştir.

Çalışmada, üç temel araştırma sorusu cevaplanmaya çalışılmıştır:

(1) Güney Kore'de deepfake içeriklere yönelik ilginin düzeyi nedir?

(2) Güney Kore'de deepfake içeriklere yönelik Google aramalarında öne çıkan konular nelerdir?

(3) Güney Kore'de deepfake içeriklere yönelik Google aramalarındaki baskın konuların zamansal değişimi nasıldır?

Bu çalışma, deepfake içeriklerle ilgili arama terimlerini "cinsel içerik", "deepfake içerik oluşturmanın teknik yöntemleri" ve "deepfake içerik bulmaya yönelik aramalar" olmak üzere üç tema altında sınıflandırmak için sözlük tabanlı bir metin analizi yöntemi kullanmaktadır. R programlama dili, özellikle "gtrendsR" ve "trendecon" paketleri kullanılarak, Google arama verilerine ulaşılmış ve ulaşılan aramalarla ilgili aylık ve günlük veriler analiz edilmiştir.

Analizler, Aralık 2017'de deepfake içeriklere olan ilginin kayda değer bir şekilde artış gösterdiğini ve bu ilginin Mart 2018'de zirveye ulaştığını ortaya koymaktadır. Güney Kore'deki deepfake içeriklere yönelik bu eğilim, ünlülerin manipüle edilmiş videolarının Reddit'te paylaşılmasının ardından küresel çapta ilgi görmesiyle paralellik göstermektedir. Mart 2018 sonrasında ilgi görece azalsa da Ağustos 2024'e kadar göreceli olarak yüksek seviyede kalmış ve özellikle K-pop yıldızlarını içeren deepfake içerikleri nedeniyle zaman zaman önemli artışlar yaşanmıştır.

Bu çalışmanın önemli bulgularından biri, Güney Kore'de deepfake içeriklere yönelik aramaların %77.81'inin cinsel içerikli aramalara odaklanmasıdır. Bu kategori içinde, aramaların çoğunluğu Güney Koreli ve yabancı kadın ünlüler üzerine yoğunlaşmıştır. Analizler, cinsel içerikle ilgili tüm

aramaların kadın figürler ile ilgili olduğunu ve bu durumun toplumsal cinsiyete dayalı bir istismarı yansıttığını göstermektedir. Bu bulgu, kadınları hedef alan rıza dışı olarak deepfake yöntemi ile oluşturulan cinsel içeriklerin internet üzerinde en yaygın olarak karşılaşılan deepfake içerik türü olduğunu belirten önceki araştırmalarla örtüşmektedir.

Aramaların %14.09'unu oluşturan ikinci kategori ise deepfake içerik oluşturmanın teknik yönlerine odaklanan aramalardır ve bu da kamuoyunun bu tür içeriklerin üretimi hakkındaki merakını yansıtmaktadır. Deepfake oluşturma ile ilgili teknik aramaların Temmuz ve Eylül 2018 ile Ekim 2019 ve Nisan 2021'de kısa süreliğine cinsel içerikli aramaları geçmesi, deepfake oluşturma tekniklerine yönelik ilgide kısa süreli artışlara işaret etmektedir.

Aramaların %8.09'unu oluşturan son kategori ise, deepfake içerik bulmaya yönelik aramalardan oluşmaktadır. Güney Kore'nin pornografiyi yasaklayan katı yasaları, insanların bu tür içerikleri yasal kısıtlamaları aşmak için kullanması nedeniyle deepfake video aramalarının yüksek hacme ulaşmasında etkili olabileceği belirtilmiştir.

Çalışmada ayrıca, deepfake içeriklere olan ilginin zirve yaptığı belirli tarihlerdeki günlük arama trendleri analiz edilmiştir. Bu analizler sonucunda üç önemli tarihin öne çıktığı sonucuna ulaşılmıştır. Bu tarihler, 19 Mart 2018, 10 Ekim 2019 ve 27 Şubat 2021'dir. 19 Mart 2018'de, K-pop yıldızı Kim Seol-hyun'u içeren bir deepfake videonun internet üzerinde yayınlanması, arama faaliyetlerinde benzeri görülmemiş bir artışa yol açmıştır. Benzer şekilde, 10 Ekim 2019 ve 27 Şubat 2021 tarihlerindeki artışlar, deepfake içerik üretiminin teknik yönlerine yönelik kamu ilgisindeki artışı yansıtarak deepfake içeriklerin nasıl oluşturulduğuna dair merakın arttığını göstermektedir.

Beklenmedik bir bulgu ise siyasi olayların ve süreçlerin, özellikle seçimlerin, Güney Kore'de deepfake içeriklere yönelik kamu ilgisini önemli ölçüde etkilemediğini göstermektedir. Bu durum, diğer ülkelerde yapılan araştırmalarla zıtlık göstermektedir; çünkü diğer ülkelerde deepfake içeriklere olan ilginin, yanlış bilgilendirme ve politik manipülasyon endişeleri nedeniyle seçim dönemlerinde arttığı gözlemlenmektedir. Ancak Güney Kore bağlamında, arama terimleri ağırlıklı olarak ünlüler, cinsel içerik ve teknik yönlerle ilişkili olup, politik deepfake içeriklere yönelik ilgiye dair çok az kanıt sunmaktadır.

Sonuçlar Güney Kore'de deepfake tüketiminin, özellikle de yabancı ve Güney Koreli kadın ünlülerin hedef alan cinsel içerikler ile ilgili olarak, cinsiyetçi doğasını vurgulamaktadır. Bu bulgu, deepfake yöntemi ile üretilen cinsel içeriklerin orantısız bir şekilde kadınları hedef aldığını gösteren önceki araştırmalarla tutarlılıklar göstermektedir. Ayrıca çalışma, deepfake içerikler oluşturmak için kullanılan yazılımların ve araçların erişilebilirliğinin bu tür içeriklerin üretimi ve tüketiminde önemli bir rol oynadığını öne sürmektedir. Yapay zekâ araçlarının ve açık kaynaklı yazılımların daha geniş çapta kullanılabilir hale gelmesiyle birlikte, bireylerin genellikle kötü niyetle son derece gerçekçi deepfake videolar oluşturma imkanlarını arttırmaktadır.

Bu çalışma, Güney Kore'de deepfake içeriklere yönelik kamu ilgisinin zaman içinde kapsamlı bir analizini sunmakta ve bu teknolojiye olan ilginin evrimine dair değerli bilgiler ortaya koymaktadır. Bulgular, deepfake içeriklerle ilgili Google aramalarının çoğunlukla cinsel içerik üzerinde yoğunlaştığını ve bu durumun mahremiyet, toplumsal cinsiyet istismarı ve dijital etik ile ilgili önemli toplumsal kaygılar yarattığını göstermektedir. Ayrıca, çalışma seçimler gibi önemli siyasi süreçlerin ve gelişmelerin Güney Kore özelinde deepfake içeriklere yönelik ilgiyi etkilemediğini göstermektedir. Bu çalışma deepfake teknolojisinin yayılmasını analiz ederken kültürel ve bağlamsal faktörlerin dikkate alınmasının önemini vurgulamaktadır. Özetle, bu çalışma, Güney Kore'de deepfake içeriklere yönelik Google aramalarını inceleyerek, dijital çağda teknolojinin, kültürün ve mahremiyetin kesişimine ışık tutmaktadır.

Yazar Bilgileri

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