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Deepfake Manipulation on Social Media: A Case Study of Fraudulent Activities in Türkiye

Sosyal Medyada Deepfake Manipülasyonu: Türkiye'deki Dolandırıcılık Faaliyetleri Üzerine Bir Vaka Çalışması

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ABSTRACT: The term "deepfake," derived from the words "deep" and "fake," refers to highly realistic and deceptive content designed to manipulate perception. Deepfake content, powered by artificial intelligence, poses a threat when integrated with digital culture, enabling illegal activities by altering the faces and voices of well-known individuals. This study was conducted to examine social media-mediated deepfake fraud in Türkiye. Facebook and Instagram were scanned using four different accounts over a sixteen-month period, resulting in the collection of fifty-six deepfake videos. It was found that these videos featured significant political figures, scientists, artists, journalists, and businesspeople, all of which were fraudulent. It was observed that Lip-Sync (m = 0.75) was the primary model used in video production, followed by Text-to-Speech (m = 0.18) and a combination of Lip-Sync & Text-to-Speech (m = 0.5). The group with the highest number of deepfake videos consisted of businesspeople (m = 0.35), followed by political figures (m = 0.33), scientists (m = 0.14), journalists (m = 0.12), and artists (m = 0.03). Deepfake videos featuring Ali Koç, Ekrem İmamoğlu, Emine Erdoğan, Hakan Fidan, and Murat Ülker, selected based on their Lip-Sync performance, were analysed using Deepware, and the detection architecture was found to be insufficient. This study employed a mixed-method approach, incorporating thematic analysis and quantitative data, with frequency distributions generated using IBM SPSS Statistics 22.0. In light of the findings, suggestions for preventing victimisation are presented.

Key Words: *Artificial Intelligence, Deepfake, Digital Culture, Social Media, New Communication Technologies.*

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Öz: "Derin" ve "sahte" kelimelerinin birleşimiyle oluşan deepfake kavramı manipülatif, hiper-gerçekçi içerikleri tanımlamak için kullanılmaktadır. Yapay zeka teknolojisine dayanan deepfake içerikler, dijital kültürün olanakları ile bütünleştiğinde tehdit oluşturmakta, ünlü kişilerin yüzleri-konuşmaları değiştirilerek yasa dışı faaliyetler yürütülmektedir. Çalışma, Türkiye'de sosyal medya aracılı deepfake dolandırıcılığını incelemek amacıyla gerçekleştirilmiştir. Facebook ve Instagram platformları on altı aylık bir süre boyunca dört farklı hesapla taranmış, elli altı deepfake video elde edilmiştir. Elde edilen videoların Türkiye'nin önemli siyasi figürleri, bilim insanları, sanatçıları, gazetecileri-spikerleri, iş insanlarını içerdiği ve tümünün dolandırıcılık faaliyeti içerdiği saptanmıştır. Videoların üretiminde öncelikli modelin Lip-Sync (m = 0.75) olduğu, bu modeli Text-to-speech (m = 0.18), Lip-Sync & Text-to-speech (m = 0.5) modellerinin takip ettiği görülmüştür. En çok deepfake videoya sahip grup iş insanları (m = 0.35) olmuş, bu grubu siyasi figürler (m = 0.33), bilim insanları (m = 0.14), gazeteciler-spikerler (m = 0.12), sanatçılar (m = 0.03) takip etmiştir. Lip-Sync performansına dayanarak seçilen; Ali Koç, Ekrem İmamoğlu, Emine Erdoğan, Hakan Fidan ve Murat Ülker'in deepfake videoları Deepware ile analiz edilmiş, tespit mimarisinin yetersiz kaldığı görülmüştür. Tematik analiz yöntemini ve nicel verileri karma biçimde kullanan araştırmada, frekans dağılımları IBM SPSS Statistics 22.0 programıyla oluşturulmuştur. Elde edilen bulgular ışığında, mağduriyetlerin önlenmesine yönelik öneriler sunulmuştur.

Anahtar Kelimeler: *Yapay Zeka, Deepfake, Dijital Kültür, Sosyal medya, Yeni İletişim Teknolojileri.*

INTRODUCTION

Humanity has produced tools to fulfill its current tasks throughout the ages, and these skills and discoveries have enabled humanity to be the victor of the earth. The knowledge learned has been transferred from generation to generation, developed and used in new production practices. The adventure of artificial intelligence, which started with the question 'Can machines think?', has turned into a structure that will change daily life practices and affect business and production models all over the world in the 21st century.

Just like the development of human knowledge, artificial intelligence technologies, which have their origins in neuroscience and the discovery of neural networks, have undergone similar learning processes. The ability of machines to learn and make their own decisions has meant the realisation of complex tasks by handing them over to machines and thus a global digital transformation. These innovations have impacted not only science and technology but also art.

Researchers focusing on the subject and addressing it under the umbrella of social sciences have stated that these transformation processes will lead to major social transformations, and that the combination of artificial intelligence technologies with the dominance of the Internet and social networks may also have dangerous consequences. The concept known as deepfake, which emerged from the combination of the words deep and fake, has been instrumental in creating hyper-realistic images as if a person has performed an action that he did not perform or said a word that he did not say. While only large-scale film-series productions could access similar technology expressed as Computer-generated imagery (CGI) in the recent past, technological transformation and mobilisation have enabled all users to do this. This has created a new form of misuse of artificial intelligence, making societies vulnerable

to disinformation and manipulation. The fact that these videos reach large masses through social media tools and sponsored advertisements has required researchers, especially in the field of communication sciences, to focus on the subject. The dynamic nature of communication sciences has made it possible to offer solutions to many issues addressed under it. This study was conducted to determine the trends of deepfake videos in Turkey and to draw attention to the misuse of artificial intelligence for fraudulent purposes.

The aim was to reach over fifty deepfake fraud videos to achieve meaningful classification. In this process, audio deepfake videos were frequently encountered as well but were not included in the sample. An effort was made to reach video deepfake content with a higher potential to impact society. This process spanned sixteen months from the start of the research. Once fifty-six videos were accessed, the study was concluded, and the examination phase commenced.

For this purpose, between 17 August 2023 and 17 December 2024, Facebook and Instagram platforms were scanned through four different user profiles, fifty-six deepfake videos were obtained and classified according to production models. The five deepfake videos with the best performance were uploaded to Deepware deepfake detection software, which is built on important artificial intelligence architectures. All findings were interpreted from the perspective of communication sciences and the results were compiled.

1. Artificial Intelligence and Deepfake Manipulation

In the 17th century, René Descartes argued that the way to distinguish a human from a machine was to see if he could hold a rational conversation 'as even the most stupid men can do'. The journey of artificial intelligence, which started with Turing's question 'Can machines think?' in 1950 and continued with the Turing Test, has turned into one of the most important technological breakthroughs of the 21st century. Turing's Computing machinery and intelligence work has ideas beyond its time and offers predictions about future possibilities. According to Turing, in the future, machines would have unlimited computer memory, 'free will' to respond, software that could update itself, human-like learning abilities, and they would surprise us by exhibiting human-like behaviour. Just as Turing said, it happened and machines gained the ability to learn and make decisions (Epstein, 2009; Turing, 1950; Turing, 2009; Dennet, 2009).

Throughout the ages, people have used tools to perform various tasks in a simpler way. The creativity of the human brain enabled the invention of different machines to fulfill tasks. These machines made human life easier by enabling people to fulfill various vital needs. Humanity has developed machines, and today machines have started to help to produce machines. According to Arthur Samuel, who is famous for his checkers playing programme, machine learning is defined as the field of study

that gives computers the ability to learn without being explicitly programmed. This process actually means introducing machines to how they can be more efficient. Machine learning (ML) is the scientific nomenclature for the algorithms and statistical models that computer systems use to perform an operation. The main characteristic of the revolution created by machine learning is that an algorithm can do its job automatically after learning what to do with the data (Mahesh, 2020, p. 381).

While this situation means that machines have gained the ability to learn, it has meant an innovation that humanity has never encountered before. Breakthroughs in the field of machine learning (ML), the development of learning algorithms, and the ability to perform certain tasks without programming have paved the way for the rise of artificial intelligence (AI) applications (Gunning et al., 2019). Following these developments, the Dartmouth Conference in 1956 resulted in the adoption of the concept of 'artificial intelligence' to express these technologies and the conceptual foundations of this technology were laid.

The concept of artificial intelligence, which attracts attention in the scientific field and is at the center of many current researches, has become one of the most important technologies of the 21st century and has penetrated into various fields. Oxford Dictionary (2023) defines the concept of artificial intelligence as 'The capacity of computers or other machines to exhibit or simulate intelligent behaviour'. Researchers working in the field have also expressed artificial intelligence technologies as an effort to create machines that mimic human intelligence and have the capacity to learn and respond. The fact that machines can perform abilities such as understanding, learning and decision-making, which were unique to humans in the recent past, has undoubtedly caused a great resonance in the fields of science and technology (Mondal, 2020; Goodfellow et al., 2016; Letheren et al., 2020).

The rise of artificial intelligence technologies has led to an exponential increase in the importance of machine learning and big data-based research. There is no doubt that this technology will have a significant impact on humanity and mediate sociological transformations. For this reason, studies on artificial intelligence technologies should be carried out in the field of social sciences in order to predict what the field will mean socially.

The global dominance of digital culture and the power of screens are increasing, and information can be created, transmitted and read even faster over time. While this situation increases access to various opportunities, it also poses threats from time to time. Recent developments in the field of artificial intelligence (AI) have a strong impact on important areas such as society, economy and culture. While artificial intelligence technologies are considered a revolutionary development today, they force business and life practices to transform and become a part of digital

culture due to their ability to be integrated into various application areas (Chesney & Citron, 2019a; Karnouskos, 2020, p. 138).

The persuasiveness of the visual and its ability to provide the closest depiction of reality through screens has been mentioned many times. However, still frames are not as convincing as a hyper-realistic video recording of any event. Developments in artificial intelligence technologies are transforming traditional business models and at the same time bringing ethical debates with their negative uses. The ease of video production offered by mobile technologies, combined with social media platforms that sometimes allow malicious content to be shared and consumed, turns into a social problem. Especially when these videos are produced in a hyper-realistic manner within minutes and presented to the public, they pose a greater threat. The term 'deepfake', which is a combination of the terms 'deep learning' and 'fake', is used to describe videos produced by software that can also change the original voice or facial expressions in an image or video (Chadha et al., 2021, p. 557; Westerlund, 2019, p. 39; Söğütlüler, 2024). Thanks to the rise of 'deepfakes', it has become easier than ever to pretend that someone said or did something they did not say or do (Citron, 2018; Chesney & Citron, 2019b). This software is highly accessible and user-friendly, which in turn raises significant ethical concerns. Various websites and mobile applications, such as DeepFaceLab, Faceswap, Reface, FaceApp, and Avatarify, are used for deepfake video production. Some of these software programs are open source, allowing users to train the system simultaneously.

In the recent past, big budget productions had access to this technology, which was in the hands of major film studios within Hollywood, and these images or effects were called 'Computer-generated imagery (CGI)'. As with other technologies, fast processors, high-performance graphics cards and qualified algorithms have made this technology accessible to everyone (Maras & Alexandrou, 2019). Today, anyone can download deepfake applications or produce deepfake content in minutes with online applications. Hyper-realistic videos that show someone as if they have done an action they have not done or said a word they have not said can quickly meet with the society by taking the distribution power of social media behind them.

As can be seen in the case of Deepfake, one of the unusual aspects of the field of artificial intelligence (AI) is that its nature and effects are very difficult to define. Having a basic understanding of the nature of the artificial is closely related to a focus on the human mind and neuroscience (Fetzer, 1990). Deepfake media produced with artificial intelligence (AI) technologies, which are based on neuroscience and the discovery of neural networks, are based on artificial neural network architectures that use deep learning methods such as Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs) and Convolutional Neural Networks (CNNs), Long short-term memory (LSTM), Recurrent neural network (RNN). One of the most

common of these is Generative Adversarial Networks (GANs) (Pei et al., 2024). Generative Adversarial Networks (GANs) comprise a model that consists of both generative and discriminative neural networks. While this model generates deepfake content, it simultaneously verifies its authenticity by passing it through its own filtering mechanism. This process enables the generation of highly realistic deepfake videos. Variational Autoencoders (VAEs) encode data by compressing it into a lower-dimensional representation and subsequently decode it to generate new variations of the original input. Convolutional Neural Networks (CNNs) utilise convolutional operations to analyse visual data, extract characteristic features from videos, and apply them to the creation of manipulated content. Long Short-Term Memory (LSTM), an advanced variant of Recurrent Neural Networks (RNNs), facilitates speech synthesis to enhance the synchronisation between visual and auditory components (Goodfellow et al., 2014; Hinton et al., 2012; Tolosana et al., 2020; Goodfellow et al., 2016; Hochreiter & Schmidhuber, 1997; Lin et al., 2022).

Generative Adversarial Networks are a type of artificial intelligence algorithm designed to solve modelling problems and generate new media. Although other generative models based on deep learning are also common, GANs are among the most successful generative models (especially in terms of their ability to produce realistic high-resolution images). The main goal of GANs is to predict the structure of real data samples and generate new samples from this distribution. Since their inception, GANs have been widely studied for their performance in applications such as image generation, speech and language processing. In the field of social sciences, the manipulative aspects of deepfake media have been examined in frameworks such as technology theory (Goodfellow et al., 2020, p. 139; Creswell et al., 2018, p. 53; Wang et al., 2017, p. 588; Kwok & Koh, 2020, p. 1798; Ahmed, 2021).

The rapid use of Internet technology has become widespread, and this situation has brought rights and security violations along with opportunities. Although organisations and providers have started to take cyber security measures, they have not been fully successful (Vurgun & Akpınar, 2020). A large number of deepfake videos, mostly targeting celebrities or politicians, have been produced on the internet or social media applications, causing negative social impacts. This media content has often been used to damage the reputation of celebrities, political figures or to manipulate public opinion. For example, when American actor Jordan Peele made former US President Barack Obama say the phrase ‘President Trump is a complete idiot’ and the video looked almost as realistic as if it was actually coming from Obama's mouth, the world paid attention to the issue. Although deepfake algorithms have no good or bad qualities, there is a perception that this technology is mostly used for negative purposes. According to the Sensity report, more than 96 per cent of deepfakes are obscene and most of the victims are citizens of the United Kingdom, the United States, Canada, India and South Korea. Deepfake crimes and scams are

increasing day by day and there are thousands of victims. Scientific studies on deepfake media manipulation have also been conducted and reported significant results. Some studies have stated that deepfake media can distort individual or community memory of public events (Yu et al., 2021, p. 607; Murphy & Flynn, 2022, p. 112; Raza et al., 2022, p. 9820; Gupta et al., 2020, p. 519; Lucas, 2022).

In Türkiye, it is possible to see the negative use of deepfake media content and the victimisation arising from this situation. For example, Birgül Güden, a resident of Balıkesir, believed the fake investment advertisement she saw on her social media account, which used artificial intelligence and the voices of famous names, and was defrauded of 650,000 TL. The fraudsters who reached Birgül Gülden through the social media post stated that they were calling from the investment company named Global Gold Elite and transferred 650,000 TL to their accounts (Sözcü, 2024).

Deepfake media are categorised according to their content. In the most general terms, these categories are face and body swapping, voice swapping, text-to-speak, face-swapping, face-morphing, lip-syncing. Deep learning methods are used to extract facial features from the input face and then transfer them to the generated face. While the face in a video can be replaced with another person, the remaining original scene content and the original facial expression are preserved. These methods usually perform their operations using GAN and CNN (Chen et al, 2019; Dolhansky et al., 2019; Chadha et al., 2021). Although studies in the field have tended to categorise deepfake media production methods into two main categories, the boundaries of production have gradually expanded. Although research on this topic dates back to 2017, the development of algorithms is thought to date back to 2006 (Zhang, 2022; Yu et al., 2021, p. 608-609). These techniques have been frequently used for categorisation in the academic literature. The production models presented below by Chadha, Kumar, Kashyap and Gupta (2021) are important in terms of showing the techniques in deepfake production.

Table 1: Deepfake production models

Deepfake Types	Method & Description	Example	Application
Photograph Deepfake	**Face and Body Swapping:** Altering a person's face and body by blending features	A mobile application using aging filters	Customers can virtually try on clothing and cosmetics before purchasing
Audio Deepfake	**Voice Swapping:** Replacing a person's voice with another individual's voice	Used to deceive a manager by mimicking a CEO's voice, leading to a $243,000 transfer	Mimicking professional speakers for audiobooks
	Text-to-Speech: Converting written text into audio	A controversial recording was generated using Jordan B. Peterson's voice	Used in the film industry to correct mispronunciations
Video Deepfake	**Face-Swapping:** Replacing an original face with another face	In *Fast & Furious*, Paul Walker's face was swapped with his brother's	Swapping an actor's face with a stunt performer to ensure safety
	Face-Morphing: Altering a face through seamless morphing transitions	*Saturday Night Live* star Bill Hader seamlessly morphs into Arnold Schwarzenegger on a talk show	In video games, players can apply their own faces to avatars
Audio and Video Deepfake	**Lip-Syncing:** Synchronising mouth movements with audio while mimicking the voice	*You Won't Believe What Obama Says in This Video* is a notable example	Advertisements and instructional videos can be translated into different languages without re-shooting

Source: Chadha et al., 2021

In recent years, rapid progress in the fields of artificial intelligence and machine learning has created a variety of tools that have been put into use to manipulate media content or produce unrealistic media. Although deepfake technology has been used for legitimate purposes such as entertainment and education, malicious users have started to use these videos for illegal purposes. High-quality fake videos, images or sounds have been produced for purposes such as spreading misinformation and political messages, fuelling discord and hatred, harassing, defrauding, and blackmailing people. At the same time, the faces of individuals have been replaced with faces from various obscene content and circulated on the Internet without the consent of the persons concerned. The existence of this technology undermines the trust in video evidence and negatively affects the value of

evidence in judicial processes (Maras & Axandrou, 2019, p. 255; Rana et al., 2022, p. 25494; Shao et al., 2022; Koopman et al., 2028).

Various approaches have been proposed in the literature to deal with these problems, and global companies such as Microsoft and Intel have announced that they have developed their own software to intervene in this situation (Ho, 2024; Intel, 2022; Rana et al., 2022, p. 25494). Although global technology giants have taken up the issue, studies on its detection have not been carried out sufficiently. This situation leads people who believe in deepfake media content to difficult situations.

2. Current Developments in Detection of Deepfake Media

Recent advances in digital technologies have significantly increased the capacity to produce realistic images and videos using advanced computer graphics and artificial intelligence algorithms. Deepfake video production software offers the potential to produce videos that are not real but are of high quality, paving the way for negative uses. New technologies that make it increasingly difficult to distinguish between real and fake media content have enabled the use of artificial intelligence (AI) to produce hyper-realistic videos showing a person saying and doing things that never happened. Coupled with the speed of social media, persuasive deepfakes have the potential to quickly reach millions of people and have a negative impact on societies (Chadha et al., 2021, p. 557; Westerlund, 2019, p. 39; Güera & Delp, 2018; Naitali et al., 2023; Kumar & Sharma, 2023, p. 2153). This increase in the number and quality of deepfake videos requires the development of reliable detection systems that can automatically warn users about the unauthenticity of such content on social media and the internet. While recently rapidly developed algorithms and software make it possible to produce deepfake videos even with mobile devices, automatic systems developed for the detection of fake videos still do not achieve great success (Bondi et al., 2020; Ab-Khazraji et al., 2023, p. 429; Pashine et al., 2021; Allen et al., 2024; Ahmed et al., 2022). Although this is the case, detection technologies are rapidly developing to prevent the potential misuse of deepfakes, and research on their detection is increasingly being conducted.

Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM), XceptionNet, Generative Adversarial Networks (GANs) models are prominent in deepfake detection (Kaur et al., 2024). These models primarily focus on analysing anomalies in images, inconsistencies with physical reality, voice-mouth synchronisation issues, loss of clarity—such as the noticeable blur present in many deepfake videos—and logical inconsistencies (Kaur et al., 2024; Tolosana et al., 2020; Goodfellow et al., 2016). The models rely on deep learning methods, especially GANs, to generate realistic deepfake media. Generative Adversarial Networks can also be used in the detection of deepfake media as they carry the traces of the generated models (Yu et al., 2018).These detectors use trained

artificial neural networks to detect various inconsistencies and unrealities in video content (Aggarwal et al., 2021).

Although the number of academic research on the subject is small, the detection of deepfake videos has been discussed in recent scientific publications, and studies have been carried out to examine what the benefits and threats of deepfake technology are, which deepfake examples exist, and how deepfakes can be combated. The research conducted by Westerlund (2019) analysed 84 publicly available online news articles and stated that although deepfakes are a significant threat to society, the political system and the business world, they can be prevented in various ways. The researcher stated that they can be combated through legal regulation, institutional policies, voluntary action plans, education and training, as well as the development of detection software and content verification systems. Touching on an important issue regarding deepfake content, the study reported that the opening of new business areas in the field of cyber security and artificial intelligence will have positive effects on video detection.

The research conducted by Chadha et al. (2021 p. 557) discussed deepfake types, deepfake creation and detection methods, and created a framework about the current situation. The research conducted by Rana et al. (2022) systematically examined the current studies on deepfake media content detection. Analysing 112 relevant articles presenting various methodologies from 2018 to 2020, the researchers identified four different main categories. These categories were deep learning-based techniques, classical machine learning-based methods, statistical techniques, and blockchain-based techniques. They evaluated the capabilities of detection methods by utilising different data and concluded that deep learning-based methods perform better than other methods in detecting deepfake content. According to Zhang (2022, p. 6259), recent developments in deepfake production have made the content produced more realistic and easier to produce. This situation has become a threat to important elements such as national security, democracy, society and privacy. In order to combat potential threats, deepfake detection methods should be developed and attention should be paid to this field, and analysing these videos under various classifications makes it easier to combat them. The researcher evaluated the capabilities of detection methods by utilising different data and concluded that deep learning based methods outperform other methods in detecting deepfake content.

According to Zhang (2022, p. 6259), in order to combat potential threats, it is necessary to develop deepfake detection methods and give importance to this field, and analysing these videos under various classifications makes it easier to combat them. It is possible to classify existing deepfake creation and detection methods. In addition, deepfake media content can be divided into four types according to their types: audio video, silent video, audio and image. Existing deepfake research and

applications mainly focus on models that can produce highly realistic fake images with facial hairstyle, gender, age and other features.

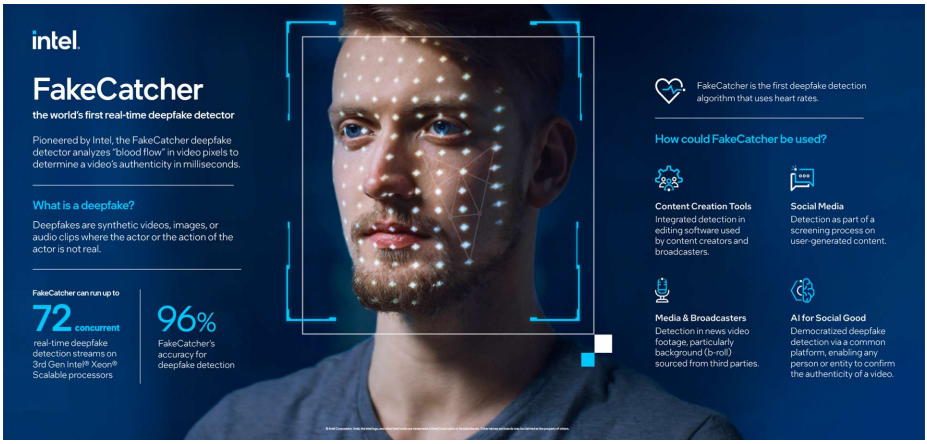
Deepfake images and videos have some unique features that can be distinguished from real images and videos. These features can be categorised as biometric features, model features and media features. Biometric features primarily use cues such as eye blinking, lip synchronisation, facial and head movements, head pose, colour, texture, shape. Studies have shown that in deepfake videos, elements such as eye blink patterns, eyebrow movements, lip synchronisation, facial geometry, head position, nose width, eye distance, chin height, etc. do not match the reality and can be detected from here. Some studies have stated that deepfake techniques do not take into account the ears by only dealing with the facial structure and that it would be more accurate to focus on the ears (Zhang, 2022, p. 6264; Li et al., 2018; Pan & Yang, 2010; Wang, 2020; Korshunov & Marcel, 2018; Zhao, 2020; Montserrat et al., 2020; Jung et al., 2020, p. 83144; Agarwal & Farid, 2021, p. 981).

Studies on deepfake media content have also been carried out in Türkiye, and scientists have rapidly started to conduct research on the subject. These studies include deepfake videos and their impact on the audience (Çil, 2023, p. 173), political deepfake content as an element of visual disinformation (Karakoç & Zeybek, 2022), examination of discussions about deepfake in Turkish Reddit post (Tulga, 2024), deepfake applications in advertising (Karcı, 2024), digital transformation with ChatGPT and deepfake (Kırık & Özkoçak, 2023), the effect of deepfake use in advertising film on visual narrative (Acar & Tanyıldızı, 2022), deepfake as a danger of the age (Berk, 2020).

The focus of global companies on the issue has given hope that the negative use of such content can be prevented. FakeCatcher, developed by Intel and various collaborations, is one of the technologies aiming to prevent negative uses. The technology in question has also been expressed as an innovation that can be utilised for social media applications.

According to Intel (2022), while most deep learning-based detectors use raw data to find fake media content, FakeCatcher prioritises human-specific features. To do this, it focuses on the blood flow of the person in the video. When the heart pumps blood, the colour of the veins changes, and these signals are mapped by algorithms. In the next stage, deep learning is used to determine whether the deepfake content is real or fake. It is stated that this technology can be used in social media to detect deepfake content before it spreads.

Image 1: Intel real-time deepfake dedector (2022)



Microsoft has also focussed on the issue, developing software to detect deepfake videos and raising public awareness. According to Vanessa Ho from Microsoft (2024), there are three important steps to protect against deepfake media content. These are to determine whether the source from which the media content is transmitted is reliable, to consider the production intention, and to detect inconsistencies and anomalies.

According to Tahir et al. (2021, p. 174), although steps are being taken by companies to detect deepfake media and prevent negative conditions, they are still insufficient. Deepfake media, coupled with the accelerated distribution models of social media platforms, have given a whole new meaning to deception, propaganda and disinformation. Researchers in the field of social sciences argue that steps should be taken to increase social awareness of deepfakes.

3. Research Design

The research focused on deepfake content circulated through Facebook and Instagram videos in Türkiye, and was conducted to obtain these videos and evaluate detection software. The research data were collected over a sixteen-month period between 17 August 2023 and 17 December 2024. A total of 56 deepfake videos were obtained, including scientists, journalists and news presenters, artists, business people and political figures. Some examples and the type of deepfake content are presented below. In the research, it was aimed to make a meaningful categorisation by obtaining more than fifty deepfake videos. In this process, audio deepfake and visual deepfake contents were encountered many times. However, the research focused on hyper-realistic video deepfake content. For this reason, only the videos in the sample were included in the scope of the research.

Table 2: Examples of deepfake content of political figures used for fraudulent purposes

				
Ali Babacan	Emine Erdoğan	Ekrem İmamoğlu	Hakan Fidan	Recep Tayyip Erdoğan
Lip-Sync	Lip-Sync	Lip-Sync	Lip-Sync	Lip-Sync

Table 3: Examples of deepfake content of political figures used for fraudulent purposes-2

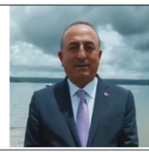
				
Cevdet Yılmaz	Mansur Yavaş	Mehmet Şimşek	Mevlüt Çavuşoğlu	Özgür Özel
Lip-Sync	Lip-Sync	Lip-Sync	Lip-Sync	Lip-Sync

Table 4: Examples of deepfake content used by scientists for fraudulent purposes

				
Aziz Sancar	İlber Ortaylı	Canan Karatay	İbrahim Saracoğlu	Mehmet Öz
Lip-Sync	Lip-Sync	Lip-Sync	Text-to-Speech	Text-to-Speech

Table 5: Examples of deepfake content used by business people for fraudulent purposes

				
Acun Ilıcalı	Ali Koç	Burak Özdemir	Murat Ülker	Selçuk Bayraktar
Lip-Sync	Lip-Sync	Text-to-Speech	Lip-Sync	Lip-Sync

Table 6: Examples of deepfake content used by journalists and news presenters for fraudulent purposes

				
Cem Küçük	Fatih Altaylı	Fatih Portakal	İsmail Küçükkaya	Pınar Erbaş
Lip-Sync	Lip-Sync	Lip-Sync	Lip-Sync	Text-to-Speech

Four different social media accounts were used to obtain the data, and the details were examined by clicking on the content identified as deepfake. At the same time, the 'I want to see more' option was clicked on these posts-advertisements in order for the Meta algorithm to present more videos. This goal was realised and the Meta algorithm presented more content to the relevant profiles between the specified dates.

The thematic analysis method was used to analyse the deepfake videos in the study, and the contents were classified according to the production models compiled by Chadha et al. (2021). The content analysis method was chosen because it provides the researcher with flexibility in the relevant subject and the opportunity to determine the appropriate framework for the context (Weber, 1990; Krippendorff, 2018; Neuendorf, 2018). The top five videos with the best Lip-Sync were selected according to the described criteria and used for the evaluation of deepfake detection software. Deepfake Lip-Sync videos of Cevdet Yılmaz, Emine Erdoğan, Ekrem İmamoğlu, Hakan Fidan and Murat Ülker, whose faces are clearly visible, were uploaded to the Deepware deepfake detection website. Google optimisation was taken into account in the selection of the site and Deepware was selected as one of the priority sites for the keyword 'deepfake detector'. The best Lip-Sync videos were analysed and the model results were tabulated. Person rankings were created in alphabetical order. All data are evaluated in relation to each other under the heading of Findings and Discussions.

4. Findings and Discussions

Artificial intelligence technologies, whose origins date back to the discovery of neuroscience and neural networks, have assumed important tasks at various levels of social life and have been used for many positive purposes. Since the first discussions on artificial intelligence in the 1950s, machine learning has continued unabated, and models capable of replacing humans in many tasks have been produced.

In addition to the positive uses of artificial intelligence technologies, their negative uses have also increased and they have started to be used for illegal purposes. One of the negative uses has been deepfake media content, which is frequently encountered in social media applications, which are especially important in terms of communication sciences. These contents have increased in Türkiye as well as in the world, and victims have emerged. The dynamic structure of communication sciences has enabled studies to shed light on the subject and many researchers have tried to draw attention to the issue.

This study aims to examine the presentation of deepfake media to the public through social media tools and the execution of various manipulation activities. Over a period of sixteen months, Facebook and Instagram platforms were scanned from four different accounts and fifty-six deepfake videos were obtained. The videos were

classified according to their models and thematic structures. It was determined that all videos contained actors with high influence in the social sphere. These figures were political actors, scientists, journalists and news presenters, artists and business people. The table below shows the frequency distribution of the categories in the videos.

Table 7: Categorisation of the content of deepfake videos

Category	Frequency	Percent	Cumulative Percent
Political Figures	19	33.93%	33.93%
Scientists	8	14.29%	48.22%
Journalists and News Presenters	7	12.50%	60.72%
Artists	2	3.57%	64.29%
Businesspeople	20	35.71%	100.00%
Total	56	100%	100.00%

Names in the videos obtained; Acun Ilıcalı, Ali Babacan, Ali Koç, Aziz Sancar, Burak Özdemir, Canan Karatay, Cem Küçük, Cevdet Yılmaz, Ekrem İmamoğlu, Emine Erdoğan, Fatih Altaylı, Fatih Erbakan, Fatih Portakal, Fulya Öztürk, Hakan Fidan, Haluk Levent, Hülya Hökenek, İbrahim Saraçoğlu, İlber Ortaylı, İsmail Küçükkaya, Mansur Yavaş, Mehmet Şimşek, Mevlüt Çavuşoğlu, Murat Ülker, Mustafa Karataş, Pınar Erbaş, Recep Tayyip Erdoğan, Seda Öğretir, Selçuk Bayraktar, Temel Kotil. Some figures have also produced multiple deepfake videos that are different from each other. In particular, it is possible to see that various deepfake content has been produced about Selçuk Bayraktar. The table below shows the videos and their frequency distributions according to the deepfake technique.

Table 8: Technical categorisation of depfakes

Category	Deepfake Type	Frequency	Percent	Valid Percent	Cumulative Percent
Political Figures	Lip-Sync	16	34.78%	34.78%	34.78%
	Lip-Sync,Text-to-Speech	1	2.17%	2.17%	36.96%
	Text-to-Speech	2	4.35%	4.35%	41.30%
Scientists	Lip-Sync	4	8.70%	8.70%	50.00%
	Lip-Sync, Text-to-Speech	0	0.00%	0.00%	50.00%
	Text-to-Speech	4	8.70%	8.70%	58.70%
Journalists & News Presenters	Lip-Sync	6	13.04%	13.04%	71.74%
	Lip-Sync, Text-to-Speech	0	0.00%	0.00%	71.74%
	Text-to-Speech	1	2.17%	2.17%	73.91%

	Lip-Sync	2	4.35%	4.35%	78.26%
Artists	Lip-Sync, Text-to-Speech	0	0.00%	0.00%	78.26%
	Text-to-Speech	0	0.00%	0.00%	78.26%
	Lip-Sync	16	34.78%	34.78%	91.30%
Businesspeople	Lip-Sync, Text-to-Speech	1	2.17%	2.17%	93.48%
	Text-to-Speech	3	6.52%	6.52%	100.00%

It was observed that Lip-Sync architecture, which is used in deepfake video production and provides the most realistic image, was mostly used, followed by Text-to-Speech and Text-to-Speech techniques, respectively. All the people in these videos give unrealistic investment advice and direct users to websites they have created. The directed websites were created by cloning public institutions and news websites similar to their origin. In order to participate in the investment advice, the user has to leave his/her phone number on the website. Shortly after leaving the number, a non-legal person makes a call and carries out the fraudulent activity.

Due to the realistic appearance of deepfake videos and websites, it was seen that the incidence of victimisation may increase, and it was considered necessary for communication scientists to focus on the issue. Deepware models for the analysis of deepfake videos are presented below. The videos analysed below were selected from the fifty-six deepfake videos based on their superior Lip-Sync accuracy. It was observed that the relevant deepfake videos were primarily circulated by bot accounts—software-based accounts programmed to mimic human behaviour on social media platforms. Compared to human-managed social media accounts, these bot accounts exhibited lower interaction levels and shared fewer images. The tables generated by the Deepware software for the analysis of deepfake videos are presented below in their original form, without any modifications.

Table 9: Ali Koç Lip-Sync deepfake video model results

Ali Koç Lip-Sync Model Results		**Video Features**	**Audio Features**
Avatarify	No Deepfake Detected	Duration	Duration
	(10%)	44 sec	44 sec
Deepware	No Deepfake Detected	Resolution	Channel
	(35%)	720 x 720	stereo
Seferbekov	No Deepfake Detected	Frame Rate	Sample Rate
	(35%)	30 fps	44 khz
Ensemble	No Deepfake Detected	Codec	Codec
	(35%)	h264	aac
No Deepfake Detected			

Ekrem İmamoğlu is a Turkish businessman, politician and the Mayor of Istanbul Metropolitan Municipality. He is a prominent member of the main opposition (Republican People's Party) in Türkiye and is a frequent political figure on the screens. The fact that the party to which Imamoglu belongs appeals to a large electorate in Türkiye and that he is the mayor of the largest province has enabled him to appear in deepfake videos. The videos were produced by malicious people who wanted to carry out fraudulent activities by creating a political influence, and the video was circulated through a page called Leighton Rosales. Ekrem İmamoğlu's video, which is a realistic Lip-Sync deepfake video example, was analysed using Deepware and it was determined that it was performed with deepfake. Model results and content features are presented below.

Table 10: Ekrem İmamoğlu Lip-Sync deepfake video model results

Ekrem İmamoğlu Lip-Sync Model Results		**Video Features**	**Audio Features**
Avatarify	No Deepfake Detected	Duration	Duration
	(30%)	76 sec	76 sec
Deepware	Deepfake Detected	Resolution	Channel
	(97%)	720 x 720	stereo
Seferbekov	Deepfake Detected	Frame Rate	Sample Rate
	(82%)	30 fps	48 khz
Ensemble	Deepfake Detected	Codec	Codec
	(94%)	h264	aac
Deepfake Detected			

Emine Erdoğan is the wife of Recep Tayyip Erdoğan, the 12th President of the Republic of Türkiye. Emine Erdoğan is a political figure who stands out for carrying out social responsibility projects and carrying out various solidarity activities. Emine Erdoğan was also a founding board member of the Istanbul Provincial Women's Branch of the Welfare Party. She took part in the establishment of the 'Social Development Centre' (TOGEM) and carried out social responsibility projects such as 'Haydi Kızlar Okula' and 'Ana-Kız Okuldayız'. Since Emine Erdoğan is a well-known figure on the screens, a deepfake video of Emine Erdoğan was also produced, and it was aimed to carry out fraudulent activity by creating a political influence. The video was circulated by a page called Attraction in Estonia. Emine Erdoğan's video, which is a realistic example of a Lip-Sync deepfake video, was analysed using Deepware, and it was not detected that it was made with deepfake. The model results identified the video as 'suspicious' and its content characteristics are presented below.

Table 11: Emine Erdoğan Lip-Sync deepfake video model results

Emine Erdoğan Lip-Sync Model Results		Video Features	Audio Features
Avatarify	Suspicious	Duration	Duration
	(77%)	50 sec	50 sec
Deepware	No Deepfake Detected	Resolution	Channel
	(2%)	720 x 720	stereo
Seferbekov	No Deepfake Detected	Frame Rate	Sample Rate
	(20%)	25 fps	48 khz
Ensemble	No Deepfake Detected	Codec	Codec
	(4%)	h264	aac
Suspicious			

Hakan Fidan is a Turkish soldier, academic, bureaucrat, diplomat and politician, and the Minister of Foreign Affairs of the current Republic of Türkiye. Hakan Fidan has served as the President of the National Intelligence Organisation for many years and has witnessed important turning points in Türkiye. Hakan Fidan, who stands out with his important duties in the fields of politics and security, is also a figure who frequently appears in mass media. For this reason, his videos were produced to realise the deepfake fraud and circulated by the page named Alquaida on the Facebook platform with a sponsored advertisement. Hakan Fidan's video, which is a realistic Lip-Sync deepfake video example, was analysed using Deepware, and it was not detected that it was produced with deepfake. The model results identified the video as 'suspicious' and its content characteristics are presented below.

Table 12: Hakan Fidan Lip-Sync deepfake video model results

Hakan Fidan Lip-Sync Model Results		Video Features	Audio Features
Avatarify	Suspicious	Duration	Duration
	(56%)	36 sec	36 sec
Deepware	No Deepfake Detected	Resolution	Channel
	(2%)	720 x 720	stereo
Seferbekov	No Deepfake Detected	Frame Rate	Sample Rate
	(23%)	30 fps	48 khz
Ensemble	No Deepfake Detected	Codec	Codec
	(10%)	h264	aac
Suspicious			

Murat Ülker is a Turkish businessman and industrialist. He is the chairman of the board of directors of Yıldız Holding, the largest food company operating in the CEEMEA (Central and Eastern Europe, Middle East and Africa) region. Deepfake videos have been produced because he is an economically powerful figure representing an

important brand. Through a page called Page này lập ra để tìm bạn kèm Toán, a deepfake video of Murat Ülker was circulated as a sponsored advertisement. Murat Ülker's video, which is a realistic Lip-Sync deepfake video example, was analysed using Deepware, and it was not found to be produced with deepfake. The model results identified the video as 'suspicious' and its content characteristics are presented below.

Table 13: Hakan Fidan Lip-Sync deepfake video model results

Murat Ülker Lip-Sync Model Results		Video Features	Audio Features
Avatarify	No Deepfake Detected	Duration	Duration
	(0%)	101 sec	101 sec
Deepware	No Deepfake Detected	Resolution	Channel
	(35%)	720 x 720	stereo
Seferbekov	Suspicious	Frame Rate	Sample Rate
	(54%)	30 fps	44 khz
Ensemble	No Deepfake Detected	Codec	Codec
	(48%)	h264	aac
No Deepfake Detected			

The best five videos selected among the fifty-six videos were analysed by Deepware, but the detection algorithms were not sufficient to detect the videos in question. Deepware reported that only one video was produced with deepfake in Ali Koç (No Deepfake Detected), Ekrem İmamoğlu (Deepfake Detected), Emine Erdoğan (Suspicious), Hakan Fidan (Suspicious), Murat Ülker (Suspicious). This proves that Deepware, one of the most renowned detection companies, has not yet been able to show absolute success in Lip-Sync videos.

CONCLUSION

Throughout history, humanity has produced tools for the tasks it needs to perform and used them for its purposes. This close connection between production and use has become more abstract in modern life, and a mechanism other than humanity has emerged that can make decisions by reasoning. Undoubtedly, this development is out of the ordinary for human history and therefore it is very difficult to determine its limits.

The strengthening structure of artificial intelligence and machine learning has opened the door to many innovations. Production, consumption, entertainment, access to information and daily life have been transformed in various aspects, and the transformative potential of artificial intelligence technologies has become visible in every field.

Technological developments have not always opened a white page for humanity. Just as nuclear energy has not only been used for a more sustainable ecosystem, artificial intelligence technologies have not only been used to contribute to humanity. These negative uses have become increasingly visible in the field of artificial intelligence, and a new type of content called deepfake, which is a combination of the words 'deep' and 'fake', has emerged. Hyper-realistic image production, which shows individuals as if they have done actions they have not done and said words they have not said, has become accessible to everyone. This situation has led to the emergence of many victims in the world and in Türkiye, and social media deepfake fraud has been on the rise.

Considering this fact, the research aims to focus on the issue and prevent victimisation by drawing attention to it. In this context, Facebook and Instagram were scanned by four different social media users between 17 August 2023 and 17 December 2024. Fifty-six various deepfake videos were obtained over a period of sixteen months. Qualitative and quantitative data were used in the research, deepfake video contents were analysed by thematic analysis method and divided into themes according to the speaker. In the mixed-method research, it was determined that the majority of the videos were created with Lip-Sync (m=0.75 where m indicates proportion of total deepfake content) technique, followed by content created with Text-to-speech (m=0.18), Lip-Sync & Text-to-speech (m=0.5) techniques, respectively. All videos were found to contain fraudulent activity through investment recommendation. In the groups where the most deepfake content was created, business people (m=0.35) ranked first, followed by political figures (m=0.33), scientists (m=0.14), journalists and news presenters (m=0.12), artists (m=0.03).

Fifty-two of these videos were obtained from Facebook and four from Instagram, suggesting that Facebook presents a greater risk for deepfake scams. One of the main reasons for the higher prevalence of deepfake scams on Facebook is its widespread use among older age groups in Türkiye. Numerous studies indicate that younger generations exhibit greater resistance to disinformation and are better at distinguishing fake information compared to older generations (Think With Google, 2019). Consequently, deepfake content primarily targets middle-aged and older users, particularly those with financial means.

The videos ranked in the top five according to their Lip-Sync performance were uploaded to Deepware, an application that uses important artificial intelligence architectures, and models of the videos were presented by a software that is prominent in the detection of these videos. The results for deepfake video detection showed that the models currently available to users based on artificial intelligence cannot provide absolute accuracy in detecting deepfake videos. The deepware

application was only able to make a deepfake judgement in one video, found two videos suspicious, and failed to detect deepfakes in the other two.

This situation showed the importance of individual protection from such videos. It has been observed that users should pay attention to whether there are logical errors in the videos they watch, mouth movements and voice harmony, the reliability of the source where the video is presented, the appropriateness of facial expressions and gestures with speech, and verifying the information from various sources will prevent victimisation. It has been observed that more care should be taken especially in videos featuring business people and politicians. It has been observed that it would be useful for future studies to measure the awareness of the subject by conducting quantitative studies on deepfake fraud and to take steps to increase social awareness on the subject by conducting scientific projects.

From the perspective of communication sciences, deepfakes represent a form of fake content that falls under key topics such as disinformation, media ethics and manipulation, public perception, and social media dynamics. These contents will remain a social threat until platforms develop effective detection software. Given that communication sciences are one of the dynamic fields within the social sciences, it is crucial for researchers to focus on this issue, conduct projects, and organise campaigns to raise public awareness.

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