IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 10, October 2025

DOI: 10.17148/IARJSET.2025.121032

Deepfake Detection System

Devika Verma[1], Dr. Ashish Tamrakar[2]

Student, Computer Science & Engineering, RSR-Rungta Collage of Engineering, Bhilai, CSVTU, India[1]

Associate Professor, Computer Science & Engineering, RSR-Rungta Collage of Engineering, Bhilai, CSVTU, India[2]

Abstract: Deepfake can distort our perception of the truth and we need to develop a strategy to improve their detection. Deep Fakes are increasingly detrimental to privacy, social security, and democracy. We plan to achieve better accuracy in predicting real and fake videos.

Keywords: Deepfake, Deepfake detection System, Face Forensic, AI arms race, Computer Vision

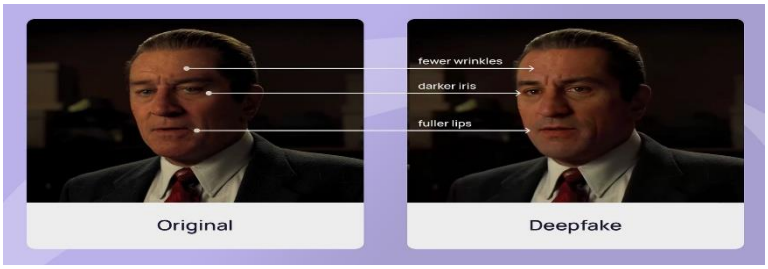
I. INTRODUCTION

Deepfake algorithm is used to examine the facial expression and the body moments, and then it compares the other human facial expression with the same body moments. It also checks the voice that is spreading at the internet with the name of any celebrity is original or not? Because many celebrities become the victim of such cases where wrong video or voice messages spreading in the wrong way. Worries regarding deepfakes have resulted in a growth of countermeasures, prompting researchers to conduct extensive research. And lectures describing strategies to defend against them abound at computer vision and graphics conferences.

II. OBJECTIVE

The objective of this paper is to give the reader a better knowledge of:

- How Deepfake in media is generated and identified.
- The latest developments and breakthroughs in this realm.
- Weaknesses of existing security methods.
- Areas requiring more investigation and consideration.



III. MODEL DESIGN AND SELECTION

Due to the nature of deep neural networks being data-driven, it is necessary to acquire massive deepfake datasets with various different synthesis methods in order to achieve promising results. The following deepfake datasets were used in the final model at DF Detect:

- DeepFake-TIMIT
- FaceForensics++
- Google Deep Fake Detection (DFD)
- Celeb-DF
- Facebook Deepfake Detection Challenge (DFDC)

Prerequisites

- Python 3
- Keras
- TensorFlow
- EfficientNet for TensorFlow Keras

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 10, October 2025

DOI: 10.17148/IARJSET.2025.121032

- OpenCV on Wheels
- MTCNN
- Django

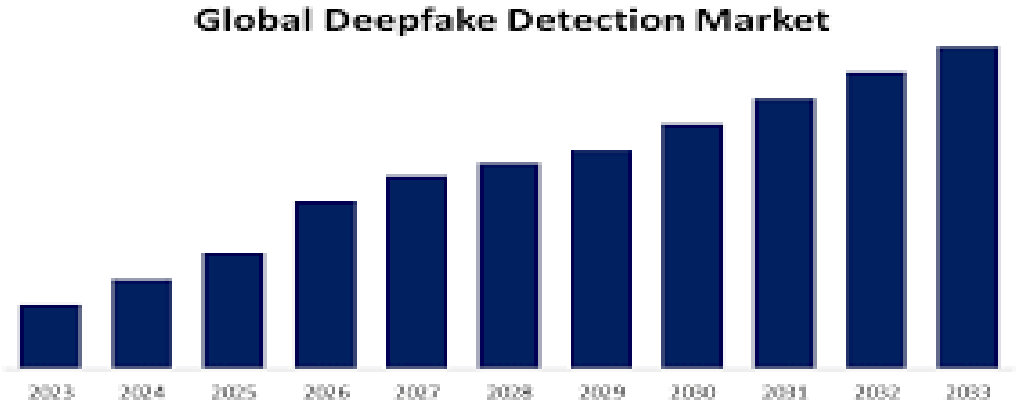


Fig. 1 Global Deepfake Detection Market

Market Growth Projection	The global deepfake detection market is projected to grow significantly, with some reports forecasting a compound annual growth rate (CAGR) of over 37% between 2023 and 2033.
Market Drivers	The market is driven by the increasing need to prevent misuse of AI-generated media, such as videos and images, in various sectors
Fastest-Growing Verticals	Industries such as banking, financial services, and insurance (BFSI) are expected to be the fastest-growing verticals for deepfake detection, due to a rise in synthetic fraud and regulatory pressure.
Largest Market Share	Video deepfake detection currently holds the largest share of the market, as the widespread use of video content increases the potential for manipulation.
Deepfake Detection System Performance	Deepfake Detection System learning models can achieve detection rates of 91% to 98% on benchmark datasets like the FaceForensics+ and Celeb-DFv2, provided the fakes are similar to those in the training data.
Real-time Detection Technology	Technology used in identity verification can detect deepfakes in real-time by analyzing responses to challenges like blinking on command. A forged video or audio would fail such a test.

IV. CONCLUSION

Deepfake Detection System learning models can achieve detection rates of 91% to 98% on benchmark datasets like the FaceForensics++ and Celeb-DFv2, provided the fakes are similar to those in the training data. Technology used in identity verification can detect deepfakes in real-time by analyzing responses to challenges like blinking on command. A forged video or audio would fail such a test. Deepfake Detection Systems represent a critical and ongoing effort in the "AI arms race," where detection technologies must constantly evolve to keep pace with increasingly sophisticated deepfake generation methods. While deep learning-based systems have achieved high accuracy in controlled environments, significant challenges remain concerning real-world effectiveness, ethical implications, and legal frameworks.

REFERENCES

[1]. DEEPFAKE DETECTION ON FACE IMAGES & VIDEOS USING DEEP LEARNING 1B. Manish, 2C. Manish, 3B. Sai Kiran Reddy 1Student, 2Student, 3Student 1Artificial Intelligence & Machine Learning, 1Anurag University, Hyderabad, India

[2]. iFakeDetector: Real Time Integrated Web-based Deepfake Detection System Kangjun Lee, Inho Jung, Simon S. Woo

[3]. Design and Implement Deepfake Video Detection Using VGG-16 and Long ShortTerm Memory

[4]. Laor Boongasame, Jindaphon Boonpluk, Sunisa Soponmanee, Jirapond Muangprathub, Karanrat Thammarak

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 10, October 2025

DOI: 10.17148/IARJSET.2025.121032

[5]. Manoj Kumar Das, Manav Kumar, Ishank Kumar kapil, Dr Rajesh Kumar yadav, "Deepfake Creation Using Gans and Autoencoder and Deepfake detection", in 2023 nd International Conference on Vision Towards Emerging Trends in Communication and Networking Technologies (ViTECoN). IEEE, (2023).

[6]. Kartik Bansal, Shubhi Agarwal, Narayan Vyas, "Deepfake Detection Using CNN And DCGANS To Drop-Out Fake Multimedia Content: A Hybrid Approach", in 2023 International Conference on IoT, Communication and Automation Technology (ICICAT). IEEE, (2023).

[7]. Kalicharan Jalui, Aditya Jagtap, Saloni Sharma, Gilofer Mary, Reba Fernandes and Megha Kolhekar, "Synthetic Content Detection in Deepfake Video using Deep Learning" in 2022 IEEE 3rd Global Conference for Advancement in Technology (GCAT). IEEE, (2022).

[8]. Kalicharan Jalui, Aditya Jagtap, Saloni Sharma, Gilofer Mary, Reba Fernandes and Megha Kolhekar, "Synthetic Content Detection in Deepfake Video using Deep Learning" in 2022 IEEE 3rd Global Conference for Advancement in Technology (GCAT). IEEE, (2022).

[9]. Niteesh Kumar, Pranav P, Vishal Nirney, Geetha V, "Deepfake Image Detection using CNNs and Transfer Learning", in 2021 International Conference on Computing, Communication and Green Engineering (CCGE) JSPM's RSCOE, Pune, India. Sep 23-25, 2021. IEEE, (2021).

[10]. Tianchen Zhao, Xiang Xu, Mingze Xu, Hui Ding, Yuanjun Xiong, Wei Xia, "Learning Self Consistency for Deepfake Detection", 2021 IEEE/CVF International Conference on Computer Vision (ICCV). IEEE, (2021).