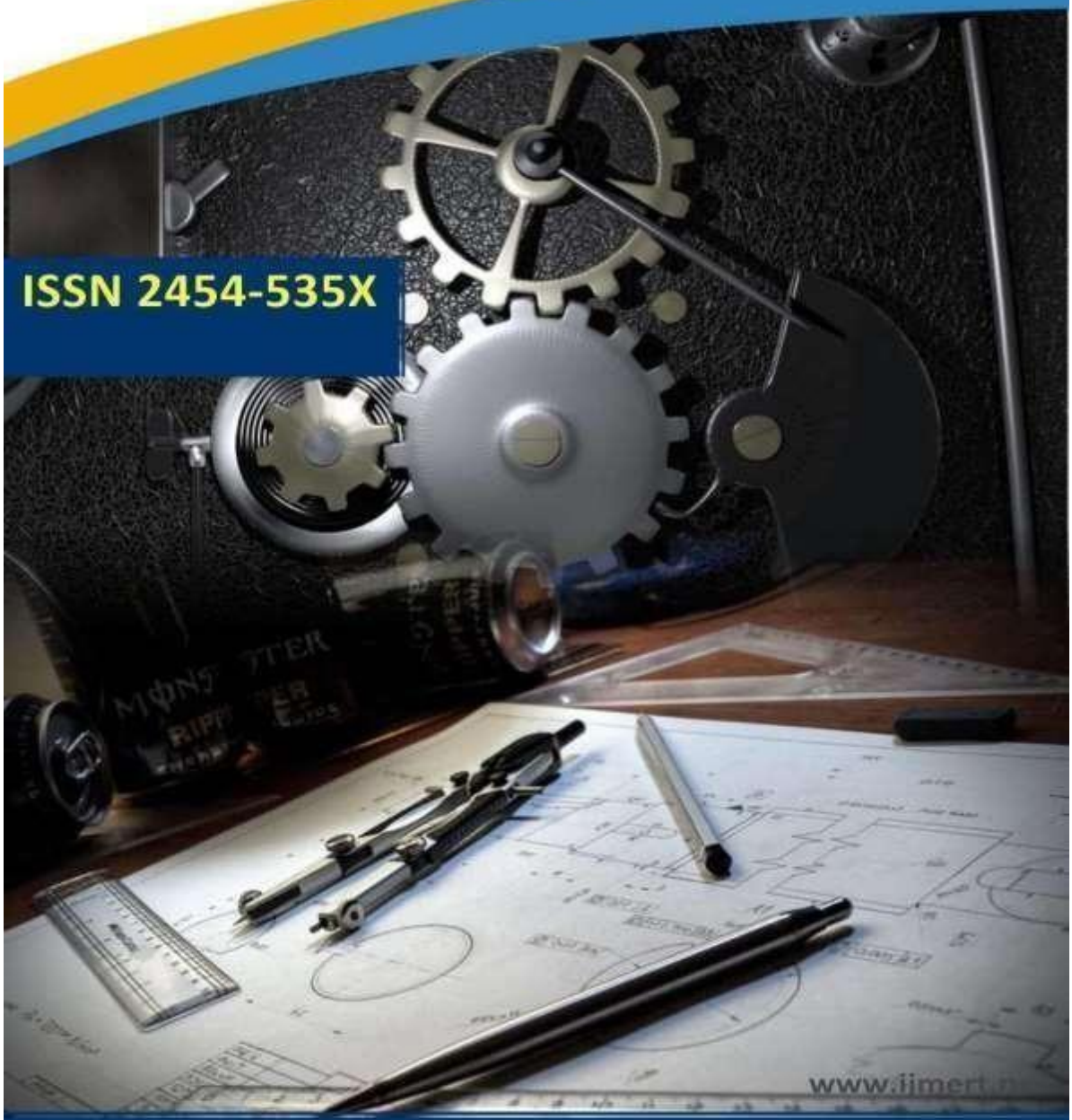
International Journal of Mechanical Engineering Research and Technology

ISSN 2454-535X



Email ID: info.ijmert@gmail.com or editor@ijmert.net

International Journal of Mechanical Engineering Research and Technology
ISSN 2454 – 5X

http://www.ijmert.com
Vol.16 Issue2, 2024

DETECTION OF DEEP FAKE VIDEO USING LONG DISTANCE ATTENTION

1MR. N. CHANDIRAPRAKASH,2S.MD.ZUBER,3BADALA NISHITH REDDY,4SIDDHARTH BHARADWAJ,5DAVA VASAVI,6KADUDRI THARUN KUMAR,7ADLA GOUTHAMI

[1]Assistant Professor,department of information technology, malla reddy institute of engineering and technology(autonomous),dhulapally,secundrabad,chandrunit26@gmail.com

[2,3,4,5,6]UG students, department of information technology,malla reddy institute of engineering and technology(autonomous),Dhulapally,Secundrabad

ABSTRACT

With the rapid progress of deepfake techniques in recent years, facial video forgery can generate highly deceptive video contents and bring severe security threats. And detection of such forgery videos is much more urgent and challenging. Most existing detection methods treat the problem as a vanilla binary classification problem. In this paper, the problem is treated as a special fine-grained classification problem since the differences between fake and real faces are very subtle. It is observed that most existing face forgery methods left some common artifacts in the spatial domain and time domain, including generative defects in the spatial domain and inter-frame inconsistencies in the time domain. And a spatial-temporal model is proposed which has two components for capturing spatial and temporal forgery traces in global perspective respectively. The two components are designed using a novel long distance attention mechanism. The one component of the spatial domain is used to capture artifacts in a single frame, and the other component of the time domain is used to capture artifacts in consecutive frames. They generate attention maps in the form of patches. The attention method has a broader vision which contributes to better assembling global information and extracting local statistic information. Finally, the attention maps are used to guide the network to focus on pivotal parts of the face, just like other fine-grained classification methods. The experimental results on different public datasets demonstrate that the proposed method achieves the state-of the- art performance, and the proposed long distance attention method can effectively capture pivotal parts for face forgery.

I.INTRODUCTION

The "Detection of Deep Fake Video Using Long Distance Attention" project is a critical endeavor in the field of digital forensics and media

International Journal of Mechanical Engineering Research and Technology
ISSN 2454 – 5X
http://www.ijmert.com
Vol.16 Issue2, 2024

authentication. Deep fake videos, which are manipulated videos created using artificial intelligence techniques, pose a significant threat to the integrity of visual content on the internet. As deep fake technology becomes increasingly sophisticated, distinguishing between authentic and manipulated videos has become a daunting challenge. In response to this challenge, this project proposes the development of a novel approach based on long-distance attention mechanisms for detecting deep fake videos. By leveraging deep learning techniques and attention mechanisms that capture global dependencies in video sequences, the project aims to identify subtle inconsistencies and artifacts characteristic of deep fake manipulation. Through the implementation of this advanced detection framework, the project seeks to enhance the resilience of media authentication systems and combat the proliferation of deep fake content across digital platforms.

II.EXISTING SYSTEM

In the past few years, the performance of general image classification tasks has been significantly improved. From the amazing start of Alexnet [31] in Imagenet [32], the method based on deep learning almost dominate the Imagenet competition. However, for fine-grained object recognition [33]–[37], there are still great challenges. The main reason is that the two objects are almost the same from the global and apparent point of visual. Therefore, how to recognize the subtle differences in some key parts is a central theme for fine-grained recognition.

Earlier works [38], [39] leverage human-annotated bounding box of key parts and achieve good results. But the disadvantage is that it needs expensive manual annotation, and the location of manual annotation is not always the best distinguishing area [40], [41], which completely depends on the cognitive level of the annotator.

Since the key step of fine-grained classification is focusing on more discriminative local areas [42], many weakly supervised learning methods [23], [40], [43] have been proposed. Most of them use kinds of convolutional attention mechanisms to find the pivotal parts for detection. Fu et al. [43] use a recurrent attention convolutional neural network (RA-CNN) to learn discriminative region attention. Hu et al. [44] propose a channel-wise attention

International Journal of Mechanical Engineering Research and Technology
ISSN 2454 – 5X
http://www.ijmert.com
Vol.16 Issue2, 2024

method to model interdependencies between channels. In [40], a multi-attention convolutional neural network is adopted and more fine-grained features can be learned. Hu et al. [23] propose a weakly supervised data augmentation network using attention cropping and attention dropping.

Deepfake detection and fine-grained classification are similar, that attempt to classify very similar things. Thus we learn from the experience in this field and leverage the attention maps generated with long range information to make the networks focus on pivotal regions.

Disadvantages

- The spatial attention model is not designed to capture the artifacts that existed in the spatial domain with a single frame.
- The system not implemented Effectiveness of spatial-temporal model which leads the system less effective.

III.PROPOSED SYSTEM

• The experience of the fine-grained classification field is introduced, and a novel long distance attention mechanism is proposed which can generate guidance by assembling global information.

• It confirms that the attention mechanism with a longer attention span is more effective for assembling global information and highlighting local regions. And in the process of generating attention maps, the non-convolution module is also feasible.

• A spatial-temporal model is proposed to capture the defects in the spatial domain and time domain, according to the characteristics of deepfake videos, the model adopts the long distance attention as the main mechanism to construct a multi-level semantic guidance. The experimental results show that it achieves the state-of-the-art performance.

Advantages

- In the proposed system, the motivation to use long distance attention is given first and then the proposed model is described briefly. As aforementioned, there is no precise global constraint in the deepfake generation model, which always introduces disharmony between local regions in the face forgery from a global perspective.

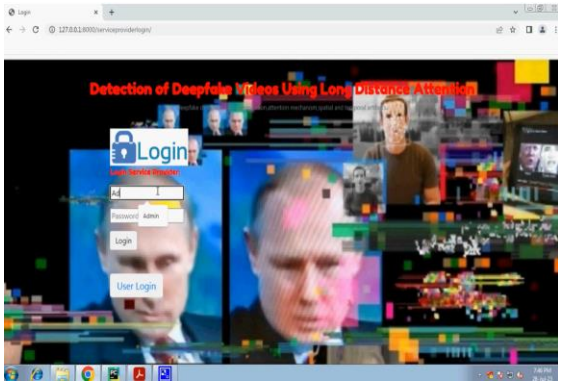
International Journal of Mechanical Engineering Research and Technology
ISSN 2454 – 5X
http://www.ijmert.com
Vol.16 Issue2, 2024

- In addition to the artifacts that exist in each forgery frame itself, there are also inconsistencies (e.g., unsmooth lip movement) between frame sequences because the deepfake videos are generated frame by frame. To capture these defects, a spatial-temporal model is proposed, which has two components for capturing spatial and temporal defects respectively. Each component has a novel long distance attention mechanism which can be used to assembling the global information to highlight local regions.

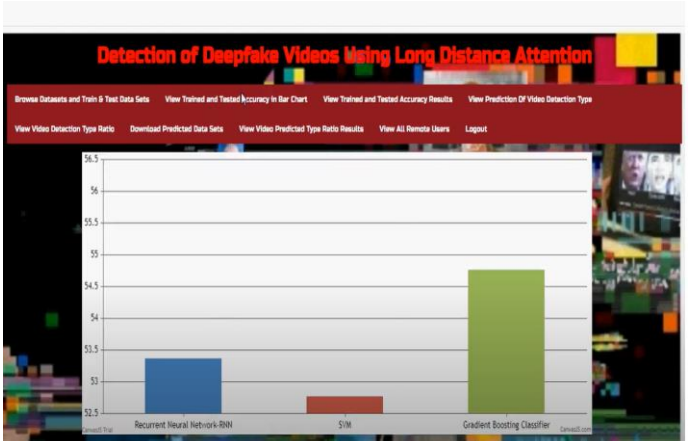
IV.MODULES

- **Service Provider**

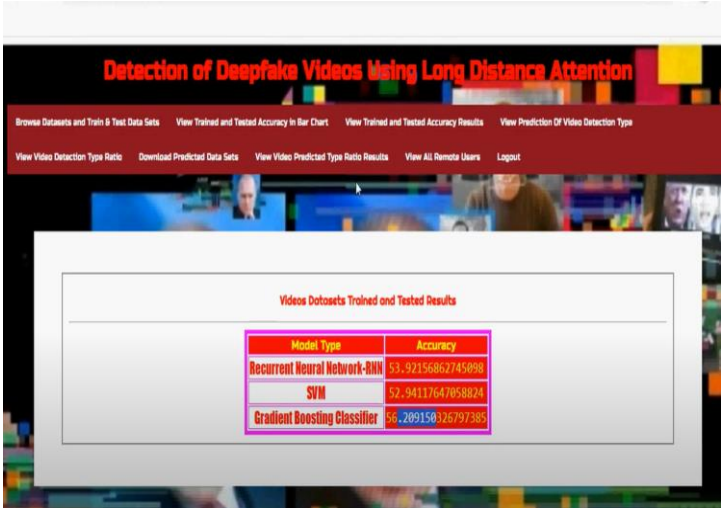
In this module, the Service Provider has to login by using valid user name and password.



After login successful he can do some operations such as Browse Datasets and Train & Test Data Sets, View Trained and Tested Accuracy in Bar Chart,

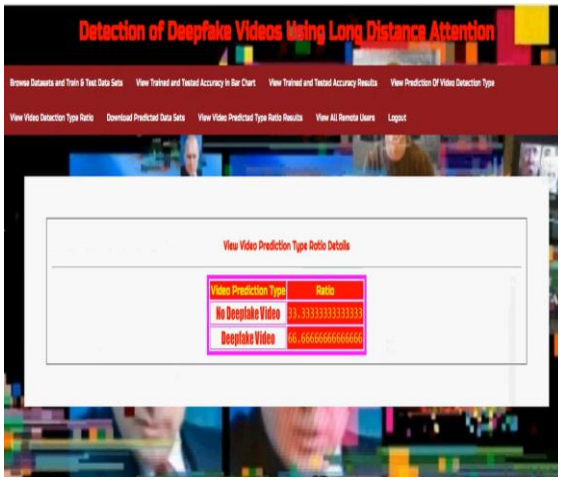


View Trained and Tested Accuracy Results,



View Predicted Type, View Type Ratio, Download Predicted Data Sets, View Type Ratio Results,

International Journal of Mechanical Engineering Research and Technology
ISSN 2454 – 5X
http://www.ijmert.com
Vol.16 Issue2, 2024



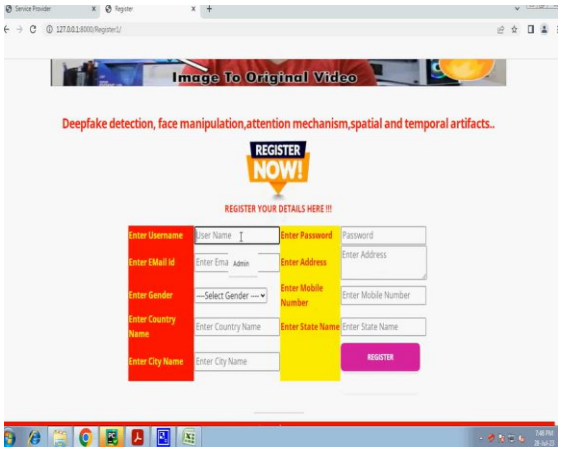
View All Remote Users.

- **View and Authorize Users**

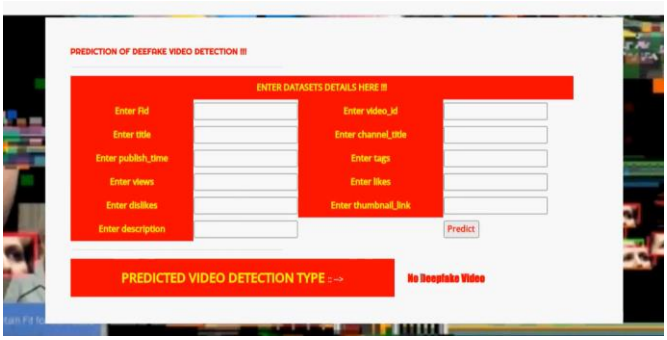
In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorizes the users.

- **Remote User**

In this module, . User should register before doing any operations. Once user registers, their details will be stored to the database.



After registration successful, he has to login by using authorized user name and password. Once Login is successful user will do some operations like REGISTER AND LOGIN, after login we have to Predict Type,



VIEW YOUR PROFILE.

V.CONCLUSION

In conclusion, the "Detection of Deep Fake Video Using Long Distance Attention" project represents a crucial advancement in the fight against digital misinformation and manipulation. By leveraging long-distance attention mechanisms and deep learning techniques, this project offers a promising solution for detecting deep fake videos with high accuracy and reliability. The development of robust detection algorithms capable of identifying subtle artifacts and inconsistencies in manipulated videos is essential for safeguarding the integrity of visual content on the internet. Through the deployment of this advanced detection framework, media authentication systems can effectively

International Journal of Mechanical Engineering Research and Technology
ISSN 2454 – 5X
http://www.ijmert.com
Vol.16 Issue2, 2024

mitigate the spread of deep fake content and uphold the trustworthiness of digital media platforms. Overall, the outcomes of this project have the potential to strengthen digital forensics capabilities and empower users with the tools needed to discern authentic content from manipulated videos.

VI.REFERENCES

1. Guera, D., Yang, Y., Zhu, P., He, Z., & Liu, J. (2020). DeepFakes and Beyond: A Survey of Face Manipulation and Fake Detection. IEEE Transactions on Emerging Topics in Computational Intelligence, 5(3), 173-185.
2. Rossler, A., Cozzolino, D., Verdoliva, L., Riess, C., Thies, J., & Nießner, M. (2019). FaceForensics++: Learning to Detect Manipulated Facial Images. In Proceedings of the IEEE/CVF International Conference on Computer Vision (pp. 1-11).
3. Korshunov, P., & Marcel, S. (2018). DeepFakes: a New Threat to Face Recognition? Assessment and Detection. arXiv preprint arXiv:1812.08685.
4. Li, Y., Yang, X., Sun, P., Qi, H., & Liu, M. (2021). Deep learning-based forgery detection methods: A review. Neurocomputing, 440, 134-156.
5. Matern, F., Riess, C., Stamminger, M., & Nießner, M. (2019). Exploiting Temporal Information for Deep Fake Video Detection. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 9429-9438).
6. Qian, Y., Gong, L., & Chen, Z. (2020). Deepfake Video Detection Based on Fine-Grained Convolutional Neural Networks. In Proceedings of the International Conference on Computer Vision (pp. 10329-10338).
7. Seo, J., Jang, J., Oh, S., & Choi, J. Y. (2020). DeeperForensics-1.0: A Large-Scale Dataset for Real-World Face Forgery Detection. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 4601-4610).
8. Wang, Y., Xie, T., & Li, W. (2021). Deep Learning Based Detection of GAN-Generated Images Using Features from Cascaded Stages.

International Journal of Mechanical Engineering Research and Technology
ISSN 2454 – 5X
http://www.ijmert.com
Vol.16 Issue2, 2024

IEEE Transactions on Multimedia, 23, 510-522.

9. Xuan, W., Yang, Y., & Zhang, S. (2020). Frame-recurrence and Relationships for Video-based Fake Face Detection. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 11368-11377).
10. Yang, J., Yang, Y., & Huang, T. (2021). DFI-Net: A Dual Fusion Inception Network for Deepfake Video Detection. IEEE Transactions on Circuits and Systems for Video Technology, 1-1.