**Machine Learning Classification and Feature Selection for Efficient Fake Face**

**Synthesized Video Identification**

A project report submitted to **Indian Institute of Engineering Science and Technology**

in partial fulfillment for the award of the degree of

### Bachelor of Technology in

**Information Technology**

### By

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**Under the supervision of Prof. Ruchira Naskar**



### Department of Information Technology

**Indian Institute of Engineering Science and Technology, Shibpur May, 2023**

### DEPARTMENT OF INFORMATION TECHNOLOGY

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**CERTIFICATE**

This is to certify that the project report entitled **“Machine Learning Classification and Feature Selection for Efficient Fake Face Synthesized Video Identification”** submitted by Arijit Dalui (Roll No. 510819100), Soumik Mukhopadhyay (Roll No. 510819102), Ritaban Bhattacharya (Roll No. 510819100) to Indian Institute of Engineering Science and Technology towards partial fulfillment of requirements for the award of the degree of Bachelor of Technology in Information Technology is a record of Bonafede work carried out by them under my supervision. This dissertation, in my opinion, is worthy of consideration for the purpose for which it is submitted and it fulfills the requirements of the regulations of this Institute. The results incorporated in this dissertation are original and have not been submitted to any University or Institute for the award of any Degree or Diploma.

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# Abstract

Recent developments in deep learning have enabled media synthesis and manipulation to reach previously unheard-of degrees of realism. The widespread use of deepfake technology to produce fake media has the potential to have a large negative influence on the reliability of multimedia data, including videos, photos, and audio recordings. The frequency domain spectrum of deepfake videos is examined in this paper, and a unique method is suggested that uses high-frequency Discrete Cosine Transform (DCT) coefficients that are retrieved from videos as a recognizable fingerprint. We create a robust model that can identify between genuine videos and their deepfakes by examining the variance of differences between subsequent video frames' DCT coefficients. We extend our work by not only using a binary classification model to classify real and fake videos but also, we go beyond classification in our research and look into the sources of bogus videos. We offer a thorough study of deepfake media by integrating our feature-based classification model with a look into the origin of the fake videos. Our comprehension of deepfake techniques and their possible impact on multimedia integrity is improved by this all-encompassing approach. We ran tests on the publicly accessible dataset Face Forensics++ to determine how well our suggested model worked. Amazingly, our model produced excellent results, with a multilevel classification accuracy of 98.56% and a binary classification accuracy of 98.91%, respectively.