



**UNIVERSITY OF  
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**INFORMATICS INSTITUTE OF TECHNOLOGY**

In Collaboration with  
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**Face Image Manipulation Detection System with Localizing  
Manipulated Regions**

A Project Specification Design and Prototype Document by

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## Abstract

The face image manipulation detection system proposed in this research combines deep learning and computer vision methods to produce accurate and dependable findings. The system begins by extracting different features from the facial image, such as color, texture, and geometry data. Then, using these attributes, a machine learning classifier is trained to distinguish between modified and unmanipulated images.

In addition to identifying manipulated photos, the system also carries out localization by determining the specific areas of the image that have been manipulated. This is accomplished by using a localizing algorithm, which takes the retrieved data and applies a heatmap display to emphasize the modified areas.

The usefulness of the suggested system was tested through experiments, and the findings show that it is highly accurate in spotting faked facial photos. In a range of situations, including those involving small modifications and those involving sophisticated manipulation techniques, the system can successfully recognize manipulated images.

In conclusion, the technique for detecting and localizing modified face photos that was provided in this paper is useful. The system is highly suited for a wide range of applications in the disciplines of digital forensics, biometrics, and security thanks to the combination of modern image processing algorithms and machine learning models.

**Keywords :** Face Image Manipulation Detection, Localization, Deep Learning, Machine Learning, Image Processing, Digital Forensics, Security

### **Subject Descriptor:**

Computing Methodologies → Machine Learning → Machine Learning Models

Image Analysis → Feature Extraction → Training of Machine Learning Classifier → Classification → Localization