Image Splicing Forgery Approachs: A Review and Future Direction

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***Abstract*—With advances in image editing tools, attempts have been made to modify images, the altered image cannot be distinguished. This paper examines various approaches to image splicing forgery, discusses the weakness of methods, analyse the existing methods, and discusses the current solution to solve those issues, and future direction. This paper presents existing datasets, pre-processing techniques, feature extraction techniques, and classification algorithms that have been used in image splicing. This paper suggests some recommendations for future research which focuses on image localization, pre-processing, and feature extraction to improve accuracy in detecting image splicing forgery.**

Keywords—Image Splicing, Watermarking, Copy move, Feature Extraction, Classification Algorithms

I. INTRODUCTION

In the digital world, current technology has developed very rapidly. Currently, many fake images have been discovered that are used in business, academic research, the military, and other important fields. This happens because of the increasing availability of sophisticated tools used to manipulate images, with computer skills anyone can change images easily [1]. With the advanced technology used, the difficulty experienced is not being able to distinguish between an image that has been manipulated by a computer and a natural image with the naked eye. If this fake image is deliberately manipulated with malicious purposes, it can have a harmful and detrimental impact on human life, society, and even the country.

Many methods have been proposed in the literature to detect image forgery. This method consists of an active method and a passive method [2]. The active technique uses signature verification that is pre-embedded in the image i.e watermark or shorthand [3]. On the other hand, passive technology analyzes the properties of digital images to detect forgered areas in the image [4]. Image forgery can be classified into copy-move counterfeit and splicing counterfeit [5]. Taking the content of an image and pasting that content back on the same image is called copy-move forgery [6]. The copy move forgery and splicing forgery are shown in Figs. 1 and 2. Splicing of images is widely used to commit crimes. Efforts have been made to overcome image splicing forgery by developing algorithms that can distinguish between damaged images and original images.

(a) (b)

Fig. 1. (a) Original image; (b) A fake image created by copying the right half of the original image and flipping it horizontally [7].

(a) (b) (c)

Fig. 2. (a) Original image; (b) Original image; (c) The forgered image generated by pasting the content contained in the original image (a) on the original image (b) [7].

Basically, the principle of forgery detection is to find a completely different area of the spliced image [8]. In general, all counterfeit detection techniques include the same phases of feature extraction, extraction, and post-processing [3]. Various changes have been made to preprocessing techniques, feature extraction techniques, and various classification algorithms to obtain the best model that can be used to detect forgery. Conversion from RGB images to YCbCr or to grayscale image are two of the many preprocessing techniques used in existing research. Fig. 3 shows the development of research focusing on image splicing detection over the last five years. The main objective of this study is to analyse and review the recent studies on image splicing detection. It is hoped that this paper will help researchers to get new discoveries in image splicing detection. The main objectives of this research include: