

Define the word
digital forgery



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According to Merriam-Webster, forgery is defined as the crime of falsely and fraudulently making or altering a document (Forgery, Merriam-Webster). So therefore, digital forgery involves falsely altering digital contents such as pictures and documents. Digital forgery has occurred for many years and still remains a relevant topic today. We see it every day in newspapers, magazines, the television, and even the internet. Whether altering the way someone looks, using digital photography in a courtroom, or even bringing a celebrity back from the dead, digital photography and digital television stimulate countless questions and queries about the ethics and morals of digital forgery, with respect to today's technology, and the involvement of digital forgery in our daily lives. The questions that arise because of digital forgery can be addressed and evaluated successfully only through consideration of the history, usage, and ethics of digital forgery in order to determine how and in what ways restriction or limitation of digital forgery should occur.

Figure Understanding the history of photography and digital forgery helps one realize exactly how digital forgery became a commonly utilized method. Photography dates back to as far as 1826 when a French inventor, Joseph Nicéphore Niépce, produced the first everlasting photograph (Photograph, Wikipedia). As time went on, photography got more advanced and more complicated. Soon enough, color photographs were being produced. The first color photograph was produced by a Scottish physicist named James Clerk Maxwell (Photograph, Wikipedia). After the production of color photograph came the invention of film, which led to instant cameras, automatic cameras, and finally digital cameras. Digital photography started first in 1951 with a

video tape recorder that produced live images from television cameras by altering the information into electrical impulses and then saving the data onto a magnetic tape (Inventors). Several years later, in the 1960s, NASA used similar technology when they stopped using analog and began to utilize digital signal with their space probes to map the surface of the moon. This led to the government usage of digital technology with spy satellites and then finally led to digital photography. The first filmless camera was created by Texas Instruments in 1972 followed by the release of the first commercial electronic still camera, the Sony Mavica, in August 1981 (Inventors). The ability to create digital photographs opened up the doors for producing counterfeit images and made it easier for this to be done. However, it wasn't the first time we've seen manipulation in pictures. As a matter of fact, photo manipulation dates back to the 1860s when a picture of John C. Calhoun was edited to have his body with the head of Abraham Lincoln (Photo Manipulation, Wikipedia). Digital forgery escalated in severity during World War II when Joseph Stalin altered photographs for propaganda purposes. For instance, there was a picture taken of Joseph Stalin and NKVD leader Nikolai Yezhov. After Yezhov was executed, the picture was rereleased with Yezhov missing. The photo was manipulated using censors. Figure 1 depicts the before and after pictures regarding this instance. In another case, John Heartfield, who utilized a photo altering technique called photomontage, mocked Adolf Hitler and the Nazis in order to demoralize their misinformed purpose (Photo Manipulation, Wikipedia). The use of digital photography has made it a lot easier for one to manipulate photos today. A program that is exceptionally recognizable is Adobe Photoshop. This is the software used by Adnan Hajj, who manipulated pictures and published them during the 2006

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Israel-Lebanon conflict (2006 Lebanon War Photographs Controversies, Wikipedia). Some of the pictures depicted an emphasis of the aftermath of an IDF attack on Beriut. Another one resembled a photograph of an IAF F-16 flying over Southern Lebanon deploying multiple missiles, when it really only deployed one missile (Adnan Hajj Photographs Controversy, Wikipedia). These pictures were removed and Hajj admitted to editing the pictures. After understanding the history and numerous uses of digital forgery, one can begin to assess the ethics involved with digital forgery. <http://www.youropinionsarewrong.com/images/random/stalin-airbrush.jpg>

Based on the previous history and utilization of digital forgery, several relevant questions arise: What ethics are associated with digital forgery? Is digital forgery generally right or wrong? Who or what should take the blame for misleading digital forgery? Should we ever fully believe anything we see anymore in pictures? What can be done about digital forgery? Unfortunately, none of these questions have definite, factual answers. Rather, opinions permeate the essence of the responses to these questions. The significance and validity of each question and response can only be determined by the reader. With the current availability in photo-editing technology, one can alter almost anything in a picture. Often, despite the obvious ethical dilemmas that arise from digital forgery, the individual himself or herself is solely responsible for how cases of digital forgery are evaluated. However, even opinionated evaluation of digital forgery can lead to judgments, laws, rules, limitations, and restrictions on the future of digital forgery, making the ethics involved in digital forgery a necessary topic to consider.

In general, is the idea of digital forgery ethically acceptable? To determine whether altering an image is right or wrong, we must establish the reason for which the image is being used. Adjusting a photo for the news, whether digitally or otherwise is most likely not ethical, even though there are understandable exceptions for alteration, such as editing a picture to brighten the details, reduce the blur of a street sign in the distance, or other similar examples. In contrast to the previous application of digital forgery, an image that serves the purpose of providing evidence regarding a crime scene or creature would preferably be void of digital forgery except to bring out inherent detail already contained in the photo. In general though, the majority of digital forgery occurs because digitally altered pictures often appeal to the viewers' eyes. As long as these images are not used to mislead, then I believe that digitally altered images are ethically permissible as long as they lack malicious intent or potential. Another fact to consider regarding this question involves the broad utilization of digital forgery in current times. Picture-editing software often comes readily installed with most current computers, meaning that most people with current computers or lap tops have access to technology for digital editing. Social networking websites, such as facebook. com and myspace. com, give users the ability to post up almost any type of picture or photo, regardless of whether the picture has undergone some type of alteration. Though often misleading, especially in the cases of digital forgery with pictures of the actual user, the question of whether the altering of the picture itself is right or wrong depends on the users viewing the image and their opinions. Depending on the intent of those who partake in digital forgery, the misleading appearances of digital forgery could potentially be detrimental to the other

people. Hypothetically, a user of a social networking website might try to establish a relationship with another user based on the viewing of digitally altered pictures or photographs of that user. What is conveyed on a computer screen with a digitally forged picture may differ greatly from the actual appearance of a user, and this will likely cause a variety of problems for users who try and establish a relationship that is even partially based on the appearance of the other user. However, the user with the altered picture benefits in the sense that he or she increases the likelihood of establishing a relationship with another person based on the digitally altered picture and not the truthful portrayal of that person in reality. Whether the previous situation is overall benevolent or detrimental for both users can only be determined by those users, and whether this application of digital forgery is generally right or wrong can only be determined by an unbiased opinion of another person. Since no test or definite way to prove whether an application of digital forgery is generally right or wrong, the decision regarding the ethics of such situations ultimately falls on the individual. Yet, if a ubiquitous verdict is reached conveying that some usage of digital forgery is unethical, who or what should take the blame?

Almost indubitably, no individual desires taking blame for any type of situation, regardless of who was responsible for any discommodity associated with the situation. So in reference to the detrimental effects of digital forgery, who or what should be at fault? To understand even the possibilities of who or what should be at fault for negative effects of digital forgery, one must consider the wide array of factors influencing that usage of digital forgery. Technology plays a pivotal role in digital forgery. Because of

technology, digital forgery often lacks credibility and believability.

Advancements in technology allow people today to alter almost any picture to their preferred specifications, often still believable, but untrue and therefore misleading. Technology, in many ways, provides the means by which digital forgers are capable of producing altered pictures or photographs. However, another point to consider involves the fact that human beings are responsible for these advancements in technology that allow digital forgery to be accomplished with ease. Though maybe not directly responsible, the people who provide the software or technology for common people to digitally forge do, in a way, provide access to digital forging opportunities that would otherwise be unavailable to them. Another influencing factor to consider is society's usage of digital forgery. Magazines, newspapers, websites, and a plethora of other media portray digitally forged pictures, photographs, and images. Countless recalls and cases have formed around excessively exaggerated pictures in magazines and newspapers. Though often not intentionally detrimental, society does place pressure on individuals' actions. For example, magazines influence other magazines to use digitally altered pictures. As yet another example, people often succumb to the pressures of being slim and obtaining the socially desired "model" bodies that society conventionally expects and conveys through magazines and other such media. This may cause individuals to take action by harming themselves through unhealthy weight loss practices or even partaking in digital forgery themselves. But since it is ultimately one individual or a group of individuals that are directly responsible for the digital forgery of a specific image, one must consider whether the fault of digital forgery should lie within the individual or group of individuals that directly altered the image

itself. Obviously, blaming the misleading or detrimental digitally forged image itself can provide no compensation for those effected in a destructive manner, so only by placing blame on an individual, a group of individuals, technology, society, or other possible culprits can victims of the detrimental effects of digital forgery hope to acquire some type of compensation. Legal action can be taken regarding digital forgery, but the decision of the courtroom or judge can not universally determine who or what should bear the full or partial burden of blame regarding digital forgery. Unfortunately, once again, who or what is at fault for malevolent results of digital forgery can only be determined by the individual. But disregarding who or what is to blame for digitally forged images, if so many images are truly so misleading, to what extent should people believe what they see in digital images?

The existence of some guidelines for what people should believe and not believe when viewing digital images would seem beneficial. Any digital image, or even non-digital images in some cases, present details to a viewer that are not necessarily readily distinguishable from reality. Basically, an individual often finds it difficult to determine whether an image has been digitally altered or not. Very few ways exist of distinguishing a picture that has been altered from a picture that has undergone no such alteration. Because of this fact, viewers of images are often rightfully suspicious of the details conveyed by images. By being too suspicious however, one might neglect to realize the beauty or significance of an image that contains no digital alteration, and this beauty or significance might have been comprehended if one simply was not so suspicious of image details. So, once again, there exists no such guidelines in regards to the extent one should

give credibility to an image other than the opinions and personal beliefs of the individual. I, being an individual myself, possess personal beliefs on the ethics, credibility, and accountability of digital forgery.

My personal beliefs regarding digital forgery possess heavy influence from my past experiences. While pursuing my degree in computer engineering and simply experiencing the world in general, I have come to several personal conclusions about digital forgery. Regarding the ethics of digital forgery, I believe that digitally altered images that are intended to please the viewers' aesthetic preferences and are generally benevolent should be ethically permissible. Images that do otherwise or basically digitally forged images that are intentionally malicious or mislead the viewer into believing a false aspect should be subject to some form of compensatory action and are unethical. With reference to who or what is to blame for the detrimental consequences of digital forgery, I feel that the person who digitally altered the image should be held accountable for his or her pessimistic intentions if it truly did result in someone being harmed through viewing that image. And considering how suspicious or to what extent people should assign reliability to images in current times, I feel that most images should simply be appreciated and not analyzed with scrutiny. The images I feel that people should be suspicious of include those conveying evidence in a crime scene, details supporting assumptions about some phenomenon, or details that persuade an individual to believe an aspect not previously assumed or proved by other corroborations or support. Of course, as in almost all cases, there remain exceptions to my beliefs depending on the details of the situation itself just as there exist exceptions to almost every rule, law, or

belief of mankind. My ethical standards concerning digital forgery basically revolves more around the situation in which digital forgery was used and less on the actual digitally forged image itself. Therefore, my ethical views remain dependent on the situation itself in which digital forgery was used before I can make a finalized ethical decision, and I feel that people should adopt a similar system of perception and inspection so all that cases of digital forgery are evaluated successfully.

After understanding the history, ethics, and forming well-informed opinions concerning digital forgery, the question one would likely ponder now is: “What can be done to stop the unnecessary use of digital forgery?” Several steps have already been taken to stop distasteful digital forgery. Webster University Journal came up with a policy for the ethical use of photographs. They published that the manipulation of photographs is commonly allowed when adjusting the brightness and contrast of the photo, burning and dodging to control the tonal range, correcting the color, cropping a frame to fit a certain layout, and retouching either dust or scratches from the photo. The policy further explains that there are certain manipulation techniques that should never be allowed. These include adding, moving, or removing objects within the frame, changing the color other than to restore what the picture originally looked like, cropping a frame in order to alter its meaning, flopping an image either left or right reversal, and finally painting a photograph in other than its true orientation (Webster). These policies are very ethical in the sense that one can still alter images as an artistic sense, but when it comes to proof, evidence, or publishing, the policies are very accurate and maintain credibility. When using a photograph in a published

document, images that are manipulated are often used but should be labeled a certain way. The editor simple cannot include an altered picture and hope the readers assume the picture is edited. Altered pictures should be labeled as a photo illustration and shall never be represented as news photographs. Also, there are cameras out now with special technology to avoid digital forgery. Examples of this include cameras that digitally print a custom signature at the bottom of every picture that is taken and processed. This goal of these specially designed cameras is to stop people from not only stealing what could be copyrighted and published material but also to prevent it from being manipulated and used in media and the courtroom. In fact, many courtrooms prefer evidence and take photographic evidence only with the special signature. Another example is an image authentication system the uses fingerprint technology. The creator of many imaging products today, Epson, previously created new image authentication software that was installed in many of their digital cameras. These cameras function by automatically imprinting a photo with an invisible digital fingerprint immediately after the photo is taken. Since the fingerprint is implanted in the image file, the image can then be verified as unedited and all natural by a computer with the software installed (Digital Cameras). This leads to another way to stop malicious digital forgery, with certain software. The most popular known software that lets users edit digital images is Adobe Photoshop. This software had previously been frequently brought up in scandals of images being altered as forgery. Recently, Adobe created a way for users to still use their product for artistic and personal use, but also for publishing use. They created a suite of photo-authentication tools that released in 2008. Basically, it is a plug-in that users install onto their

Photoshop software that adds two photo authentication tools to the program (Wired. com). The first one is the Clone Tool Detector and it determines whether a section in a picture is too similar to another part of a picture. The other tool is the Truth Dots tool, which determines whether there are any missing pixels in a digital image. Determining if the pixels are missing results in a sign that the picture has been cropped, which cannot be noticed by that human eye (MandarinMusing. com). Of course, all these things can help in stopping digital image forgery, but pictures that have been taken without the special authentication signatures or fingerprints, or images edited without Photoshop's plug-ins still lack a system to prevent digital forgery. This can be solved with other special software that can detect digital image forgeries. Today, there are many companies who have produced software that have the ability to detect traces of digital image manipulation without relying on the signatures and watermarks. As a computer science doctoral thesis proposal, Micha Kimo Johnson, of Dartmouth College, created three digital image analysis tools to detect digital image forgery. These consist of illuminant direction, specularities, and chromatic aberration (Network World). The illuminant direction tools focus on the light sources of the image. It looks for consistency through the entire picture and different shadows. The light source is not limited to only sun light but also light from electricity. If the sources of light in the image were not in the same direction, the tool would detect the inconsistencies. The other tool is the specularities tool, which basically analyzes the reflective highlights in a picture. For example, if a picture of a group of people were taken and someone was digitally added to the image, the tool would detect the reflection in the eyes of all people in the picture and identify that someone was added. The last tool is the chromatic

aberration tool, which scans images based on the camera lens used. When a digital picture is taken, natural distortion occurs and is presented on the image. The tool will identify if any of the distortions do not match the surrounding and categorize the image as a forged copy (Network World). Collectively, there exist numerous ways of detecting digital forgery through the use of specialized software, which helps to inhibit the malicious use of digital forgery.

Conclusively, the issue of digital forgery has caused controversy for many years, yet recent advances in technology have helped to detect and discourage unethical uses of digital forgery. Since the creation of photography, photographic manipulation started and led into the forgery of images. Digital forgery has been apparent from the time when Soviet officials would disappear from authorized photographs in World War II to current times as we commonly view countless altered pictures in magazines, depicting celebrities with flawless skin and enhanced physiques. There exist ways to prevent digital forgery, such as special cameras that add signatures and invisible fingerprints when they are digitally processed, special programs' plug-ins that prevent the altering of images, and even special software that can detect whether a picture is forged or not. While complete termination of digital forgery is nearly impossible, prevention of digital forgery and its reckless usage is quite possible. However, the altering of digital images is now not only used to deceive, but it has been incorporated into an artistic movement in which people manipulate images to represent different aspects of life for non-harmful purposes. Though it might technically be classified as digital forgery, it only becomes an problem when these

forged images are used for the media or as evidence in courtroom. The history, evidence, discussion of ethics, and preventative methods for digital forgery helps inspire this encompassing idea: the manipulation of digital images is not necessarily unethical because of the abundance of benevolent or neutral alteration of photos, yet digital forgery with a criminal or malicious motive can most definitely be classified as unethical, for which identification systems exist to discourage and prevent detrimental digital forgery.