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**ENHANCING AI DETECTION OF GENERATED OBJECT IMAGES TO REDUCE  
MISINFORMATION**

**Rationale**

The start of AI image processing changed the way people produce unique visual contents. There are many tools that can create realistic images with little to no difference when compared to real photos. There are more than two million users who submit prompts to a discord server named Midjourney (Metz, 2022) this raises the problem of creating misinformation and forgeries. An incident where people believed Pope Francis wears a puffy balenciaga and a high magnitude earthquake hits the pacific northwest but those pictures are not real and created only using a tool (Hysu & Myers, 2023). Recent study with 99.87% accuracy in detecting fake images from real, result to be reliable and trustworthy in detecting fake images with the use of XAI (Khan & Alam, 2022) Based on this we found out that the study focuses only on face recognition and lacks of generalization, with that being said there is a gap between fake images that only have objects rather than a human face.

By modifying the current algorithm we will explore new ways for improving the generalization when it comes to detecting fake generated images that consist of objects categorized with shape, texture or color. To do this we are going to combine open source datasets CIFAR10, DeepFakeArt Challenge and fake images that we can collect in social medias, then using the current algorithm in deep learning we are going to modify it by adding algorithm that focuses filtering different type of shapes and formless shapes then identify its texture and its color after the encoded filter analyze the image the software will show the result, this leads to extending the reach of detecting ai images, doing so we are still going to aim the stability of the accuracy or give a minimal improvement to the accuracy.



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With the addition of objects this will provide a more versatile detection by removing the limitation of detecting fake images through face recognition only, extending the ways of detecting fake images serves good value as users that generate images are still rising without moderation of these it can lead to fabricated news and manipulated images.

Given the above information, the rise of users that generate ai images are prone to creating fake images that may cause misinformation and fabrication of fake products, developing fake image detection will help people to determine ai images when it comes to real ones and improve fact checking to lessen disseminating false information. However, existing fake image detections have limits on face recognition, this study aims to add new factors when it comes to detecting fake images, specifically objects that can represent a fake product to spread misleading information.

### **Significance of the Study**

This study aims to provide new factors when it comes to detecting fake images by modifying existing algorithms, fake image detectors rely mostly on face recognition however this creates a gap between fake images that only have objects to spread misinformations. By addressing the limitation it widens the capabilities of detecting fake images, with the continuously high volume of users using tools to generate ai images this study can be a starting point for future researchers.

The study also contributes to SDG17 Goal 9 (9.1) as it aims to develop a quality and reliable software by modifying existing algorithms and is purposely accessible to all users.

This study is focus on image recognitions using deep learning to create computation that will distinguish ai images to real images giving connection to Smart Engineering,



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Information and Communication Technology (ICT) thematic area.

**Scope and Limitations**

This study focuses on enhancing AI-generated image detection using deep learning techniques, specifically targeting object image recognition beyond traditional face-based deepfake detection. The research aims to modify existing algorithms to improve the generalization of fake image detection by incorporating object-based features such as shape, texture, and color. It utilizes open-source datasets like CIFAR-10, DeepFakeArt Challenge, and additional synthetic images sourced from social media. The study seeks to develop a robust detection system that can minimize misinformation and the spread of fabricated content by expanding detection capabilities beyond facial recognition. Additionally, it aims to create software that is accessible and reliable for various users, contributing to the advancement of AI-driven misinformation prevention.

However, the study has certain limitations. The effectiveness of the detection system relies on the quality and diversity of the training dataset, which may not fully represent all possible variations of AI-generated objects. The accuracy of detection could also be affected by complex backgrounds, lighting conditions, and image distortions that were not accounted for in the dataset. Furthermore, while the study modifies existing deep learning models, achieving high generalization without significantly compromising computational efficiency remains a challenge. The system does not address AI-generated video content or contextual misinformation, focusing solely on static image detection. Additionally, the reliance on available datasets may introduce biases, potentially limiting the model's adaptability to new AI-generated content that evolves beyond its trained parameters.



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### **Objectives of the Study**

The main purpose of this study is to modify existing algorithms for detecting ai images, adding new factors to distinguish generated images over real ones and improve users fact checking to lessen misinformations that generated images can make, adding new variables enhances the generalization of ai detections, specifically the study aims to add detection on images consist of objects only.

Specifically, this study wants to:

1. To develop software through modifying existing algorithms that focuses on objects images rather than human face recognition.
2. To spread important information about ai capable of generating fake images and diminishing possible misinformation to all users.
3. To develop software that is accessible to all possible users.

### **Expected Outputs**

This study expected output is to provide an improvement to the existing detectors of AI images many detector focuses on face recognition that's why this study pursue on shapes or formless shapes examining their texture and colors extending the reach of how ai images can be detected can minimize the spread of misinformation and fabrications additionally this study expects to give knowledge to people about Artificial Intelligence that can generate images.

### **References**

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