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REAL AND SIMULATED MASKED FACE RECOGNITION WITH A PRE-TRAINED MODEL

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ABSTRACT

Facial recognition has currently become indispensable owing to the efficacy of precise identification verification. Because of the distinctiveness of human biometrics, face recognition enables humans to communicate with technology while maintaining their privacy. Advancements in pre-trained models such as FaceNet have enabled improvement in identification accuracy in face recognition technology. Response to the Covid-19 pandemic has led to the replacement of conventional face recognition with masked face recognition. This change has encouraged the use of collaboration to resolve the related issues, which has resulted in the development of algorithms for face occlusion, collection of data on masked and unmasked faces and improvement of pre-trained models. Current research has utilised custom datasets or a specially produced dataset for masked face recognition. To increase the amount of data available for modelling, some studies have implemented mask simulation in facial photos. In this study, FaceNet is evaluated on two datasets: the real-masked face recognition dataset and the simulated masked face recognition dataset. Particularly, we highlight the performance of FaceNet on simulated masked faces. Using simulated masks achieved 67% accuracy, while the use of real masks achieved 84.3%. Results from the two datasets are compared with each other and with other studies using different pre-trained models with similar datasets. This study reveals that simulated masked faces perform less effectively than real masked faces, as corroborated by various other studies.

Keywords: *Masked face recognition, Face recognition, Pre-trained model, FaceNet.*

1. INTRODUCTION

In the area of deep learning and high-performance computing, the capacity of technology to accurately identify the identity of a person has gained great significance. In biometric identification, face recognition has produced better performance than retinal scans or fingerprint identification [1]. There are many types of identification that use human biometrics such as eyes, fingerprints and face for security verification. The advancement and usage of this technology has allowed humans to maintain their privacy owing to the uniqueness of human biometrics, which makes replicating a person's identity difficult. With advancements in verification technology, face recognition remains the most viable method of identity verification.

Considering the ongoing global Covid-19 outbreak, public health authorities have advised that individuals should wear face masks at all times to minimise infection rates. Consequently, contactless identity verification technology, specifically face recognition technology, has been recommended for security and attendance purposes. Masked face detection tasks have increased since the start of the Covid-19 outbreak. Extensive research has been conducted on face