Digital Mask to Improve Patient Privacy

Scientists created a digital mask using three-dimension (3D) reconstruction and deep learning algorithms to remove identifiable features from facial images.

The research team, from the University of Cambridge and Sun Yat-sen University in Guangzhou, China, ensured the mask will be able to identify signs of disease required for diagnosis.

It can identify certain disease-relevant features including deep forehead and eye wrinkles – signs associated with coronary heart disease, and abnormal changes in eye movement – signs of poor visual function and visual cognitive developmental issues.

Traditional methods of privacy protection, involving blurring or cropping identifiable areas, may lead to the loss of vital information. Whereas digital masks offer a new solution; they can capture the necessary medical information, all while protecting the privacy of patients.

The scientists input an original video of a patient's face, so that deep learning could extract facial features, and 3D construction could digitise the shapes and the movement of features, including the eyelids and eyeballs. Fortunately, a patient's personal biometric information would not be extracted, making it difficult to identify the individual.

The team tested the masks to ensure that diagnosis was precise enough for clinical use.

12 ophthalmologists ran clinical trials where they conducted ocular diagnoses of the patients based on their original facial records and based on their digitally masked images. They concluded that diagnosis using digital masks was consistent with that using original records.

Furthermore, facial recognition algorithms were unable to identify patients based on their digitally-masked images. The results prove that digital masks are a promising measure for protecting privacy. As they can simultaneously safeguard patient privacy while still offering useful information, patients are more willing to share personal information, should this method exist.

In recent times, patients have become more conscious about sharing personal information, and prefer to opt for using anonymous profiles. However, healthcare requires that people are very honest, accurate and specific with the information they share. A huge part of medicine depends on explicit details regarding patient lifestyle, behavior, and daily habits. Subsequently, medical data is invaluable to holding personal data information.

With the increase in digital technology in healthcare, robust safeguards are more imperative than ever. Digital masks offer a sophisticated tool for anonymising facial images, indicating its potential success, should it be implemented large-scale.

Source: [Nature Medicine](#)

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