OFFICIAL ABSTRACT and CERTIFICATION

A proposal of deep-learning-based Magic Mirror modules to identify specific health aspects.

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One of the most prevalent healthcare problems in the world today is that people choose not to visit the doctor's office regularly. Even when people show symptoms of sickness, they decide not to go for unsubstantial reasons, including not having enough time. Our proposed solution is to use the technique of deep learning and the advancement in IoT infrastructure to help make healthcare more accessible to the general public. We used an invention called the Magic Mirror, a device capable of displaying a plethora of data. This data includes weather, calendar, and news. Another fundamental aspect of the Magic Mirror is the customization feature, which allows a user to display whatever they want on the screen. We used this capability to create two widgets capable of detecting eyebags and acne on a human face. Each of these modules was created used convolutional neural networks. We had three approaches to creating an eye bag module. For the acne module, we separated collected full-face images into four sections of the face: left cheek, right cheek, forehead, chin. We found that the eye bag module returned the best results using images of just the eye region of the face. We also found that the acne module returned the highest percentages of accuracy when trained with right cheek images.

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